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Gleanings in Bee Culture
October 1954

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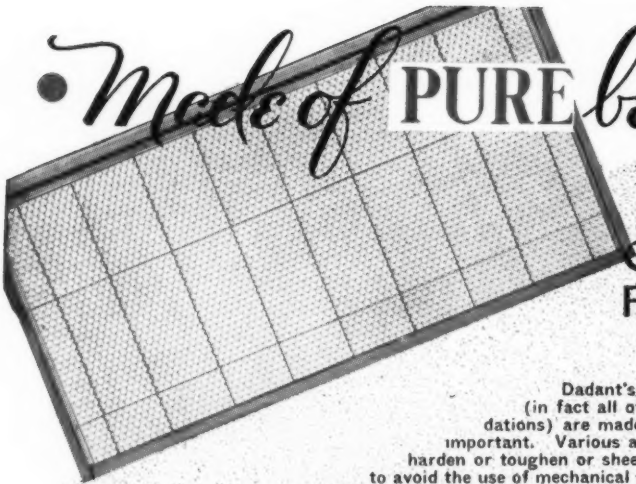
• Made of PURE beeswax



DADANT'S CRIMP-WIRED FOUNDATION

Dadant's Crimp-wired Foundation (in fact all of Dadant's Bee Comb Foundations) are made of pure beeswax. This is important. Various attempts have been made to harden or toughen or sheer up pure beeswax in order to avoid the use of mechanical supports such as are used in Dadant's Crimp-wired Foundation. However, remember beeswax is a basic raw material which goes into many products and has many uses.

Industry demands purity and refuses known mixtures. Remember, too, that the beeswax in comb honey whether in section or in bulk is actually a food because it is a part of the honey. Therefore, any mixing of other waxes with it is absolutely an adulteration.

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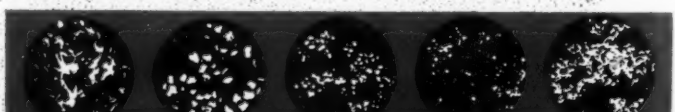

FIG. 1—Pure Beeswax: Beecy flakes, thin bars

FIG. 2—1½% carnauba wax; large, clear, bright burrs

FIG. 3—1% carnauba wax; smaller, bright burrs, tiny stars

FIG. 4—2% carnauba wax: large number burrs and stars

FIG. 5—5% carnauba wax; countless tiny brilliant crystals

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Chas. S. Engle, Beeville, Texas.

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Monthly HONEY Report

United States Market

The following figures represent an expression of current prices from beekeepers and honey packers over the country. They are based on several reports from each state averaged with the reports in the region. Where insufficient information is returned, prices have been omitted from the chart. Where three figures appear on the chart the first figure represents the low, the middle figure represents the average, and the third figure the high price in cents per pound. Where only two figures are used the low and high are shown.

	North & South Atlantic	South Central	North Central	Midwest	West
Bulk Honey:					
Table Grade	12-13-15c	12 14c	11-13-16c	11-12-13c	11-12-15c
Baking Grade	11 14	9 10	9-11-12	10 11	9-10-14
Price to Grocers:					
5 lb. jar - can	16-20-21	16-20-26	15-19-21	18-19-20	18-20-21
2 lb. jar - 12's	21-24-28	22-27-30	20-24-26	22 25	21-23-25
1 lb. jar - 24's	23-27-30	25-27-30	20-26-27	23-26-27	22-25-27
Comb Honey:					
Cs. of 24 Sec.	$7-9-10.80	$7.60	$7-8.40-9	$7.50-7.90-8	
Retail Price:					
60 lb. can	15-17-20	20 21	15-16-22	15-16-20	15-17-20
5 lb. jar	20-25-30	24-25-30	19-24-26	23-25-30	20-23-25
2 lb. jar	28-35-37	30-33-35	25-29-32	27-30-34	27-28-32
1 lb. jar	29-37-40	30 35	28-33-35	29-33-35	30-35-37
Honey Sales:	Fair	Slow	Fair	Fair	Fair
Estimated Crop:					
Conditions based on normal %	Fair to Good	Fair	Good	Good	Poor to Fair

A few comments are as follows:
"Continuous cloudy and rainy weather resulted in poorest crop in 20 years."—Oregon.
"Wild buckwheat came through with a nice crop."—S. California.
"Plenty of winter stores in the hive."—S. E. Arizona.
"Best crop since 1949 in Champlain Valley."—Vermont.
"Prospects are good for a fall flow."—Pennsylvania.
"Honey prospects poor for remainder of season."—Alabama.
"Crop very spotted."—Wisconsin.
"Good rains have put legumes in fine shape."—S. E. Minn.
"Too dry for fall flow."—Arkansas.

Canadian Market

(Unless otherwise specified, all quotations are for cases of No. 1 white.)

HALIFAX: Mkt. steady
N.B., Ont., past., paper,
24/2's $12.50
24/1's 6.50

SAINT JOHN: Mkt. firm.
Ont., past., glass,
24/16-oz. ..... $ 7.80
paper,
24/1's 6.90
24/2's 12.25

MONTREAL: Mkt. firm.
Que., White, metal,
24/2's $10.75-11.50
12/4's 10.50-11.00
glass,
24/8-oz. 4.25- 4.50
24/16-oz. .. 6.25- 6.75
Dark metal,
24/2's 6.50- 6.75

OTTAWA: Mkt. steady.
Ont., past., paper,
24/1's ..... $ 5.75- 5.80
metal,
24/2's 11.40-11.90
12/4's 11.65-11.70
Golden metal,
12/4's 8.10- 9.75
Amber, metal,
12/4's 8.50- 9.75
Man., White, metal,
12/4's 11.75

TORONTO: Mkt. firm.
Ont., past., paper,
24/2's 10.75-11.50
24/1's 5.95- 6.25
glass,
24/16-oz. 6.75- 7.00
Amber, paper,
24/2's 8.00- 8.25
Dark, metal,
24/2's 7.50- 7.75

WINNIPEG: Mkt. steady.
Man., metal,
24/2's ..... $ 9.80
12/4's 9.30
past., paper,
48/1's 11.35
24/2's 10.50

REGINA: Mkt. steady.
Sask., metal,
12/4's ..... $ 9.85-10.00
past., paper,
48/1's 11.55-12.00
metal,
24/2's 11.20-11.35
12/4's 11.00-11.05
6/8's 10.85-10.95

SASKATOON: Mkt. steady.
Sask., metal,
12/4's ..... $ 9.50- 9.75
past., paper,
48/1's 11.40-11.50
metal,
24/2's 11.20-11.30
12/4's 10.85-11.00

EDMONTON: Mkt. steady.
Alta., metal,
12/4's ..... $ 9.00-9.60
past., paper,
48/1's 10.85-11.30
metal,
24/2's 9.52-11.00
liquid, glass,
12/12-oz. 2.93- 3.35

CALGARY: Mkt. steady.
Alta., metal,
12/4's $10.40
6/8's 10.40
past., paper
48/1's 11.00-11.25
24/2's 10.50-10.75
metal,
12/4's 10.45

VANCOUVER: Mkt. steady.
Alta., past., carton,
48/1's $12.00
24/2's 11.60
metal,
24/2's 12.00
12/4's 11.60
liquid, past., glass,
12/12-oz. 4.60

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1-lb. jar - case	24	1.35	1.00
½-lb. jar - case	24	1.00	.92
5-lb. jar - case	6	$ .69	
2½-lb. sq. jar - case	6	1.18	

TIN

5-lb. tin pail case	50	$ 6.35
5-lb. tin pail case	100	12.00
10-lb. tin pail case	50	9.00
60-lb. tin can 2½" screw top, bulk		62c
case	16	$10.97
case	24	14.80

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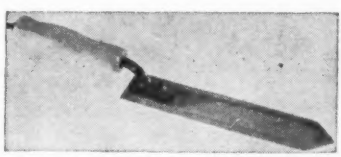

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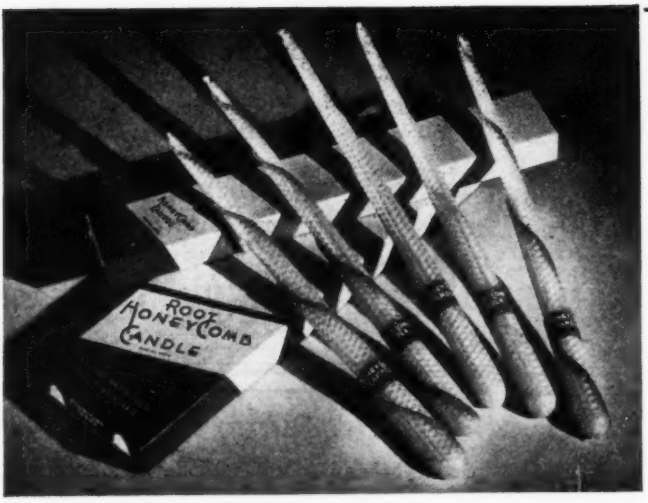

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Beekeeping in South Carolina

by W. H. PURSER, Assistant Entomologist
S. C. Experiment Station, Clemson, S. C.

Dr. M. D. Farrar observing bees in a South Carolina apple orchard.

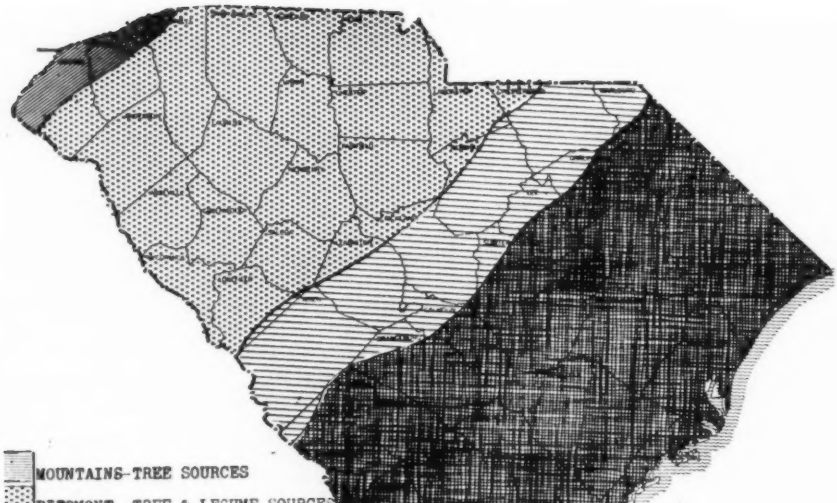
SOUTH CAROLINA possibly has as great a variation in honey plants and growing season as any state in the Union.

In the early spring blackberry blooms show up in the lower Savannah area approximately 90 days before they bloom on the north side of the mountains in Oconee County. The gap of summer is of course much shorter in the mountains than in the eastern portion of the state. Goldenrod, considered a fall plant, and black sumac are about the only noticeable plants that bloom all over the state at the same time. After midsummer, plants bloom in the mountains earlier than in the southern part of the state.

The state might well be called the sleeping giant from a commercial honey-producing standpoint. Very little honey produced by South Carolina beekeepers can be found on the shelf of the grocery store. Practically all the honey found in the larger grocery stores is imported from Florida, Georgia, and the mid-west. True, the state averages approximately 15 pounds per colony per year but colonies properly managed have produced as high as 300 pounds in one location. There are approximately 60,000 colonies in the state owned by 5,500 beekeepers. These 5,500 beekeepers are receiving less than 500 beekeeping magazines.

Some Box Hives Still in Use

In the mountains modern beekeeping methods are being used by very few beekeepers. Many box hives and hives made on the order of modern equipment but without foundation are still in use. This is the area where the famous sourwood honey is produced. Several thousand colonies are moved into this section during June and July



to gather sourwood nectar, This honey retails for 40 to 50 cents per pound. It has retailed for 75 cents per pound. It is possibly unexcelled for quality and has a very fine flavor. Granulation is never seen in sourwood honey.

In this mountainous area there are numerous bee trees. Bees are used to pollinate the many apple orchards. The beekeepers receive very little if any remuneration for the service to the orchardists. Bees from the bee trees no doubt help the apple growers. Tulip poplar, black locust, red maple, and mountain laurel are plentiful in Area I. (Mountain Section.)

The tulip poplar is largely responsible for the dark honey that comes ahead of sourwood. Mountain laurel is thought to be responsible for the bitter-flavored honey that comes just prior and overlapping sourwood. **This honey is also considered poisonous as it causes vomiting if eaten in quantity.** Beekeepers have learned not to move into the mountains until after these blooms are gone.

IN AREA II which we refer to as the Piedmont Section quite a variety of honeys are produced. Tulip poplar is probably the largest source of honey. White sumac yields in some sections of the Piedmont. Some excellent table honey is produced from the legumes in this section, especially hairy vetch and ladino clover.

The Agricultural College at Clemson is located in this area. There at the College we have Mr. W. C. Johnson, Extension Beekeeper, Prof. David Dunavan, Professor of Beekeeping, and Mr. W. H. Purser, Inspection and Research Entomologist, available at all times to aid the beekeepers of the state.

During the summer a two-day Short Course is offered at the College by the staff and visiting speakers. Throughout the year several research problems are continuously being studied.

In Area III, known as the Sandhill Section, sparkleberry is one of the major honeys. This honey is reddish color and is fair in quality.

One of the larger honey producers in the state is located in this section. His bees are left on the swamps for tupelo gum and near clover fields for clover honey. Columbia, the Capitol, is located in this section. A beekeepers' meeting is held here the Wednesday nearest the 15th of March each year.

One of the pioneer beekeepers, Mr. T. C. Gaskin, is located here but keeps bees in several locations over the state.

To add a little spice to this story let me mention a couple of events on one of my trips out among the beekeepers. One morning while I was still fresh and on my way to visit with an agricultural teacher I decided to beat the bushes a bit and noticing three or four colonies of bees sitting by a farmer's house, decided to investigate the situation. After the usual introduction, I asked the gentleman if he had any trouble with his bees.

He replied in that typical Charleston brogue, "Well, I reckon not—but one of my stands died last year. I thought they just lost their He bee."

The agricultural teacher that I mentioned had sounded an alarm concerning worms in one of his colonies with bees still going and coming. To make a long story short this teacher beekeeper was a beginner and made the mistake of using a bee escape for a queen excluder. Soon the waxworms took over the combs in his supers.

Figure 2 gives an idea of how keen the competition is at the State Fair Honey Show. This is a picture of the 1953 exhibit. For first prize the winner gets $100.00 and others get a prize in proportion. Mr. L. J. Jordan has won first place two years in a row. He lives in Lancaster.

South Carolina is known as the Palmetto State but as far as honey production is concerned this is almost a misnomer. In fact, South Carolina has very few sections that produce palmetto honey. The area around Beaufort has enough palmetto trees to produce a surplus. The tree I have reference to is the cabbage palmetto. The saw palmetto produces very little if any surplus.

THE LEADING honey-producing plants in the Coastal Plain Area are the swamp black gums, tupelo gum, gallberry, and cotton. Mexican clover is a good producer but the honey is of poor quality and off-flavor.

Mexican clover is a big help to the package-bee outfits as it comes at a time when the bees need to lay up some stores for winter.

The package bee and queen industry of the state is located in the Coastal Plain area. Mr. R. C. Cameron of Lena is one of the older heads in this business. He stores as many as 300 queens in one hive in dry cages. As soon as "the package season" is over this canny beekeeper picks up a few truck loads of packages and heads for Minnesota where he operates a large outfit for honey during the summer.

A word about findings in the pollination project: 1. According to our records it is not necessary to have bees right in the field for good pollination. Bees travel for some distance when the weather is warm and if the bees are within a mile of a field the set of fruit is just as good as when the bees are set adjoining the field. 2. The concentration of a large number of colonies within flying distance of a given field does increase fruit set.

Fig. 2.—Honey exhibits at South Carolina State Fair in 1953.

Packing bees in asphalt paper

by P. W. BURKE and A. ADIE
Department of Apiculture, Ontario Agricultural College

Packing plus a good windbreak as shown above makes for ideal wintering in northern climates. In some areas it is possible to winter without packing, but even there packing is good insurance against a long and cold winter.

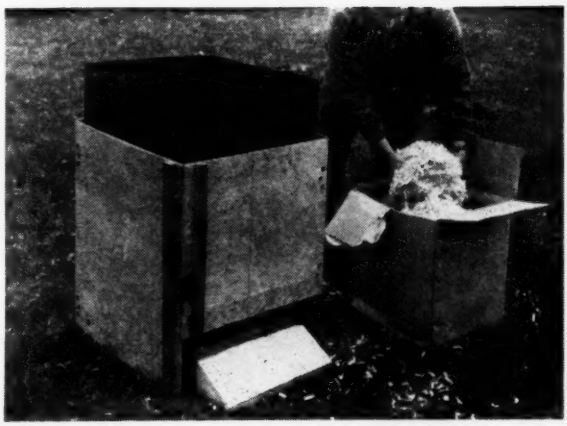
HONEYBEES SHOULD have some form of protection during the winter to help withstand sudden changes of temperature and cold winds. Insulation provided for this purpose helps conserve the energy of the bees and the food supply. Winter packing may be done during the latter half of October when it is warm enough to work comfortably but not warm enough for the bees to fly. A simple and effective means of winter protection is by the method illustrated.

For packing, Number 2 asphalt sheathing paper is recommended. Planer shavings, leaves, or straw may be used for insulation. Other materials consist of an inner cover which supplies a top entrance, a strip of wood to form a bridge

Below: Colony prepared for winter packing. Top entrance in rim of inner cover and bottom entrance has a bridge.

at the lower entrance and entrance blocks. Binder twine or other strong cord is used to hold the cover.

A roll of paper is usually about 1600 inches long, and when cut into 95-inch lengths will pack 16 colonies. This gives two inches of insulation and allows for



Paper sleeve and packing form in place.

a 5¾-inch lap. The lap joint may be sealed with asphalt pitch for asphalt sheathing, where many colonies are operated or by using three or four nails to fasten the ends together where only a few colonies are to be packed. The entrance block for the top

Nailing on top entrance block. Bottom entrance block in place.

entrance has a ¾-inch hole; the lower opening is 3" x ⅜". The paper is just pierced through these entrance allowances as each colony will open the paper to suit its own requirements. About four to six inches of insulation must

Folding in top paper above top packing.

Packing completed.

be provided on top of the colonies.

Colonies packed in asphalt paper must be fenced from livestock, as they may tear the paper.

The packing form shown gives a neatly finished job and is made to give two inches of packing. It is hinged on three corners so it may be folded flat, and is hooked at the fourth corner.

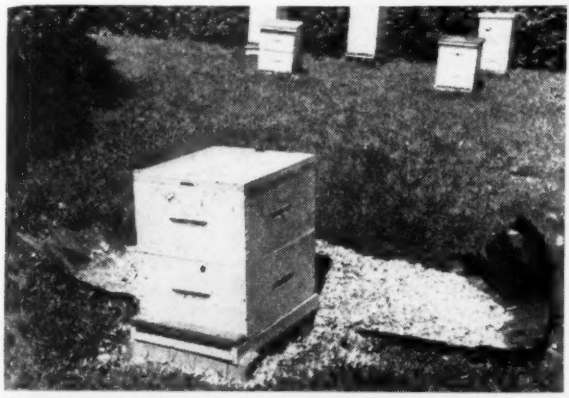
The top entrance is advantageous where snow is usually deep, or where icing at the entrance is encountered, and gives a readily accessible entrance as the cluster of bees is usually near the top of the hive in late winter and early spring. A ¾-inch hole could be bored into the top super for this purpose in place of a notched inner cover.

The Process of Unpacking the Colonies

Cover placed at front to catch front packing material. Hive tool cuts paper. Cut at front as paper already cut there for entrance.

At the present time there is a tendency to wrap colonies with the black paper without giving any insulation on the sides. Top packing as described above is used. Less paper is required and less time to do the work. However, it is questionable if the wintering results are quite as good as where side packing is used.

Throwing paper back to catch side packing by forcing paper against hive. One person may accomplish same by straddling front of hive.



Packing removed and on paper. Note cement block hive stands.

Dragging paper and packing material away for storage. Paper may be used again by sealing narrow strip down cut edge or lifting paper off colony without cutting.

History of the use of smoke for handling bees

by ROGER A. MORSE, Ithaca, New York

Part I

MAN'S ASSOCIATION with the honey bee has been a long one and when we think of all the modern equipment used in the apiary we might very well wonder how those who preceded us were able to manage their bees. Many of the records concerning early beekeeping have been lost but the literature available gives us some indication of the trials and tribulations of beekeeping from its beginning.

To work with bees we must be able to control them and to this end man has employed smoke from the earliest times. The thoughts that these men had concerning the use of smoke and the instruments they used were in many instances rather crude.

Fraser (1951) states that in ancient Egypt the kings from the first dynasty onwards had their names associated with bees. The upper portion of Egypt was known as reed land, while the lower portion was known as bee land. The symbol of power was a reed and a bee; thus indicating the monarch was king of both upper and lower Egypt.

From Ransome (1937) we read "It is, however, nearly one thousand years after the introduction of the bee as a symbol before we have direct evidence of the existence of beekeeping. In 1900 a German expedition, excavating at Abusir, found a relief which shows the industry in such an advanced condition that it must have been practiced for a very long period.

"This relief,—belongs to a series representing the seasons found in the Temple of the Sun, built about 2600 B. C. by Ne-user-re of the Fifth Dynasty. The hieroglyphs, which divide the relief into four groups, reading from left to right, have been translated as 'blowing or smoking, filling, pressing, sealing of honey.' On the extreme left a man is kneeling before the hives, taking out honey. He has something in his left hand, possibly a block of dried cow dung. like those still used by Egyptian beekeepers of the present day for smoking the bees."

An early smoker developed by A. I. Root.

The hives used by the Egyptians were made of mud and this undoubtedly made the recovery of honey from them difficult. The Egyptians recorded little and left nothing in the way of books from which we can learn about their beekeeping.

Aristotle (Thompson 1910, Translator) who lived a few hundred years before the beginning of the Christian era recorded much concerning animals in addition to his works on philosophy. To bees he devoted a number of pages but there is little of value concerning their management. He does mention that bees are smoked and that when they are, they "then devour the honey most ravenously."

Among the Romans we have many who wrote about bees and their man-

agement. The following from Pliny's Natural History (Rackham 1935, Translator) is of interest: "Some people in taking out the honey first weigh the hives, so separating the amount to be left behind. There is indeed a bond of equity even in the case of bees, and it is said that if the partnership is defrauded the hives perish. Consequently it is one of the first rules that people must wash themselves clean before they take the honey. When the honey is being removed it is very useful for the bees to be driven away by smoke, so that they may not get angry or greedily devour it themselves. Also denser smoke is employed to arouse the sloth to their tasks, for if they have not gone in incubating, the combs they make are discoloured. On the other hand excessive smoke kills them, as honey very quickly undergoes deterioration if turned sour by the least touch of moisture."

OTHER ROMANS to write about bees were Varro and Virgil. Varro (Starr-Best 1912, Translator) said the beekeeper should inspect the hives about three times a month in the spring and fall using "moderate fumigations". Virgil (Martyn 1827, Translator) in giving a reason for smoking bees says, "because otherwise, being animals of strong resentment, they would revenge their quarrel on the person who should offer to assail them." Virgil's recommendations for securing the honey are as follows (Trevelyan 1944, Translator):

"whene'er you would unseal their
narrow dwelling
And the honey hoarded in their
treasuries,
First with a draught of water
rinse your mouth,
And blow before you penetrating
smoke."

In all probability the smoker used was a pan of coals not unlike that used by many beekeepers up until about 1875.

Following the decline of the Roman Empire there were few writers on natural history. After the invention of the printing press our records of beekeeping are numerous. Hyll of London (1579) was the first man to write a book about bees in the English language. Hyll makes no mention of a smoker of any type but he does recommend the killing of bees with "yellow brimstone" in the fall to obtain the honey.

John Keys (1780) had a method of increase which is interesting although he gives credit to another man. "If the bees must be drove to form an artificial swarm, I shall prefer the Rev. Mr. Thorley's method, which he recommends for uniting, but which, with little variation is much better adopted to our present purpose.

"This is done by a narcotic fumigation produced from the **Fungus maximus,** or larger mushroom, variously known by the name of burt, punkfift, frogcheese, puffballs or mollypuffs,—they are to be dried gradually by the fire, or squeezed flat, and put into a paper bag, and then into a slow oven, after all the bread is drawn, letting them continue all night. When they will easily catch and retain fire, they are fit for use." A piece the size of "a hens egg—is—fix(ed)—to the end of a small stick."

"This done, set fire to the punk with a candle, and immediately place the stock of bees over it, tying a cloth (which you must have in readiness) round the joinings, so that no smoke may come forth. In a few minutes time you may hear them drop like hail into the empty hive."

The copy of the book from which the above was taken was Key's own copy (now in the Phillips Beekeeping Library) and it is interesting to note that Keys had struck out all of the above. We can only wonder as to the reason.

BEVAN (1838) recommended the use of a "fumigating box attached to the nozzle of a pair of bellows, and placed in the hands of an assistant, who, to prevent the fire from expiring, must keep up a gentle motion of the bellows till the smoke is no longer required." Bevan also advised that tobacco smoke was a good fumigant when examining hives. Another precaution to observe was to drink and wash the mouth with a little malt liquor, "to wash the face and hands with some, and to approach the bees with a bunch of sweet herbs during the process of inspection, breathing

(Continued on page 637)

Research develops new outlets for honey

by R. E. LOTHROP
Eastern Utilization Research Branch Agricultural Research Service
United States Department of Agriculture, Philadelphia 18, Pennsylvania
U.S.D.A. photos by M. C. Audsley

R. E. Lothrop

SINCE 1948 a research program aimed at finding new and extended uses for honey has been carried out at the Eastern Utilization Research Branch* of the Agricultural Research Service, United States Department of Agriculture. To some extent this program continued research that had been under way in the Bureau of Agricultural and Industrial Chemistry in Washington, D. C., since 1929, but which was discontinued in 1943 when most of the Bureau's research was transferred from Washington, D. C., to the four Regional Research Laboratories.

In 1948, however, Mr. George P. Walton, who was in charge of the Bureau's honey research when it was discontinued in 1943, was transferred from the Production and Marketing Administration to the Bureau's Eastern Regional Research Laboratory, and honey research was again undertaken as a Research and Marketing Act project. Dr. J. W. White, Jr., was assigned to the project as Mr. Walton's assistant, and assumed charge of the work when Mr. Walton retired in 1949. At about this time Miss Jeanne Maher was added to the staff as Dr. White's assistant.

On resumption of honey research Mr. Walton continued certain phases of the work he had been conducting at the time the program was interrupted. One of these was research designed to develop a satisfactory honey-skim milk dry powder.

In addition, however, a broad program of utilization research was initiated at the time, with initial emphasis placed on better and more profitable utilization of the dark and strong-flavored types of honey that do not always find a ready market for direct table use. It was felt that treatment to modify the color and flavor might lead to better utilization of a considerable quantity of these dark and less readily marketed honeys, particularly in the baking industry.

Methods Developed

Two methods were developed. One based on treatment with a suspension of bentonite (a volcanic clay) gave a partially decolorized and deflavored product which still retained a good proportion of the original honey characteristics. A second method, based on more drastic treatment with decolorizing carbon and filter-aid, which was preceded by treatment with lime to neutralize part of the acidity, yielded a light-colored product with virtually none of the original honey flavor remaining. Both procedures require some dilution of the honey before treatment, followed by vacuum evaporation to original honey density.

Partially or wholly deflavored honey products are perfectly wholesome materials and, except for flavor and color, contain the original honey constituents in essentially the same proportions. The procedures for preparing these products are described in detail in a processed publication issued by the Laboratory (1).

* This is the new designation for what was formerly called the Eastern Regional Research Laboratory of the Bureau of Agricultural and Industrial Chemistry, United States Department of Agriculture.

Dehydrated Honey

IN COOPERATION with the Bureau of Dairy Industry, research on the preparation of a satisfactory honey-skim milk powder was continued. Concentrated milk and honey products of good storage stability were prepared, including honey-sweetened condensed milk, evaporated milk fortified with honey, and dried honey-skim milk with 40 per cent honey solids and 60 per cent skim milk solids.

Methods of manufacture and properties of the products are described in an article published in Food Technology (2). The preparation of dried honey-skim milk powder is covered by a public service patent (3). It is being evaluated for use as an ingredient in prepared baking mixes through a research contract with a commercial firm.

Since manufacture of prepared dry mixes for home and commercial baking is a very rapidly growing industry, successful inclusion of honey as dry honey-skim milk into one or more such prepared products would represent a very large potential outlet for honey. Its availability in this form would tend to overcome some of the more common objections to using honey in baking, i. e., its physical state (stickiness) and difficulty of handling in the bakery.

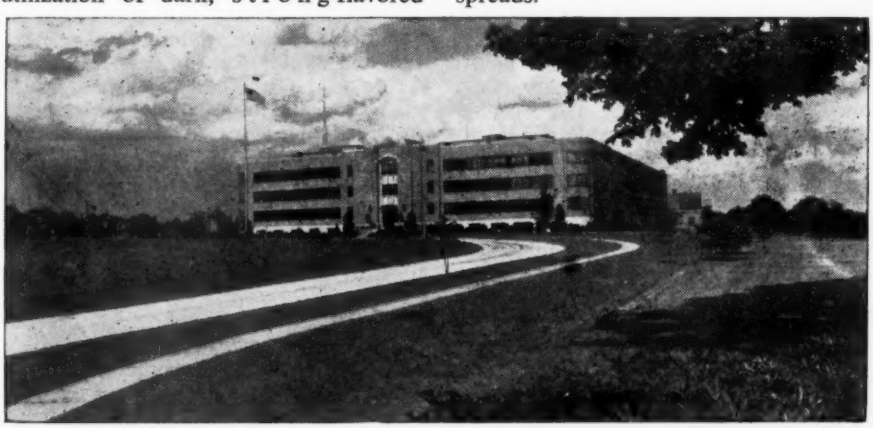
Honey-Fruit Spreads

In connection with studies on the utilization of dark, strong-flavored honeys, as described above, a bland, high-levulose syrup was prepared by decolorizing and deflavoring the less readily marketed honey types. It was felt that this syrup might be suitable for use in preparing products in which the flavor characteristics would be derived from sources other than the honey, such as a fruit juice or fruit puree.

Such products have been prepared as smooth spreads whose excellent texture is contributed by fine-grained crystallization of dextrose in the honey. Used in the same way as jams and preserves, they serve as delightful spreads for bread, toast, or crackers.

They are made by mixing fruit juice (or puree) and honey or honey syrup and finishing in vacuum to about 83 per cent solids. The mix is then subjected to controlled fine-grained crystallization to produce a smooth non-sticky consistency. Such crystallization is the basis for the natural honey product known as honey-spread, creamed honey, or Dyce-processed honey. The vacuum evaporation step may be avoided by using fruit juice concentrates. Various surplus fruits, purees, or byproduct juices may be converted into the crystallized spreads.

Fruit spreads have been prepared from honey and a wide variety of fruit materials. The spreads made from red raspberry, grape, loganberry, and orange are especially pleasing in flavor. At least two companies are producing and marketing honey-fruit spreads.



The Eastern Utilization Research Branch, Agricultural Research Service. U. S. Dept. of Agriculture. The main building contains more than 70 individual research laboratories besides the large pilot plant and special research rooms in the basement.

The preparation of these products is described in detail in articles appearing in Food Industries (4) and The American Bee Journal (5). It is covered by a public service patent (6).

Honey in Commercial Baking

ONE OF THE provisions of the Research and Marketing Act of 1946 is authority to contract research with organizations outside the Department. This has been a valuable means of conducting certain phases of our research, particularly when we do not have the special facilities needed to do a particular job. This provision also has enabled us to get more research done with the limited personnel assigned to the honey project.

Since we do not have facilities for conducting commercial baking tests at the Laboratory, research was carried out under contract with the Kansas Agricultural Experiment Station at Manhattan, Kansas, designed to determine the effects, if any, of the natural variability of honey in commercial baked goods.

Another object was to ascertain any advantages honey might offer over other saccharine products. This work was supported in part by funds from the American Beekeeping Federation.

Studies have included the use of honey in white and whole wheat bread and in various types of cakes and cookies. Extensive information on the use of honey in these products has been obtained that should be of considerable value in stimulating increased outlets in the baking industry.

The results show that by observing certain simple rules some of the difficulties encountered by bakers in using honey may be avoided. The results also indicate that acceptable types of honey improve the moisture retention and increase the shelf life of cakes. The properties of cookies, particularly the "chewy" types, are also enhanced by the use of honey. Findings as a result of this research appear in a number of publications (7, 8, 9, 10, 11).

Glass Color Standards for Extracted Honey

In cooperation with the Production and Marketing Administration of the Department (*), studies were conducted with a view to developing permanent glass color standards for extracted honey. While the Pfund Color Grader is satisfactory as a laboratory instrument, a simple and less expensive grading device was needed for official grading of honey.

Selection of suitable colored glasses to be used as standards was done by means of spectrophotometric measurements on filtered honeys, solutions of caramel in glycerin, and commercially available colored glasses. Commercial colored glasses were then found that duplicated closely both the visual colors and the spectral properties of typical honeys. The Department has arranged for the purchase of a large supply of the selected colored glasses so that an adequate supply for the estimated needs of the industry is assured.

The new color comparator (Fig. 1) containing the permanent glass color standards consists of two metal boxes having dimensions 8″ x 2″ and 3″ high, divided by thin partitions into five rectangular compartments, each of which has two windows approximately 1.2 inches square. The three lighter glass standards are mounted in one of the comparator boxes, and the three darker standards are mounted in a second comparator box. Provision is made to correct for turbidity of honey

(*) This work is now in the Agricultural Marketing Service of the Department.

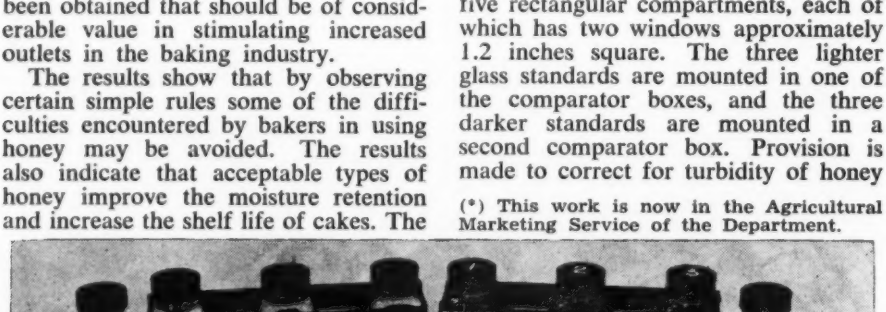
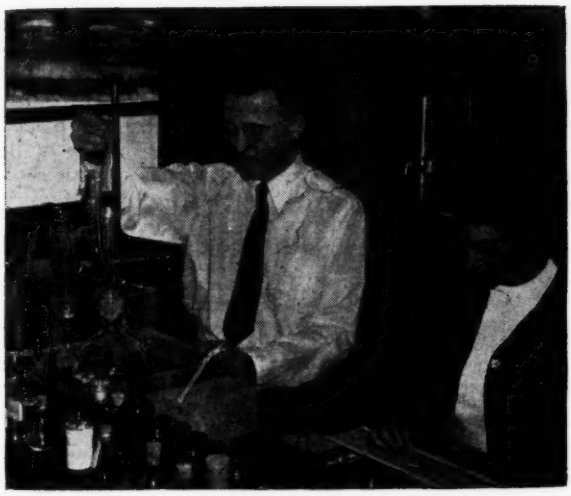


Figure 1. Color classifiers for extracted honey (front view), showing the blanks and cloudy suspensions in place behind the mounted color standards, and two samples of extracted honey to be classified.



Honey research staff at work in the laboratory. Left, Dr. J. W. White, chemist, in charge, and Miss Jean Maher, Chemist.

by use of diatomite suspension.

A complete description of the new color classifier for extracted honey is contained in a processed publication (12) issued by the Laboratory.

Composition Studies

WHILE CONSIDERABLE attention has been given to the analysis and composition of honey in the past (13, 14, 15), there is still much that is unknown regarding its composition, particularly with respect to the minor components. With the advance of analytical methods, particularly the development of new techniques such as chromatography, much of the older data on honey composition are in need of review.

A study of the action of honey invertase on sucrose was undertaken to learn more of the possible origin of some of the minor sugars of honey (16). The study suggests that these hitherto unreported sugars may be formed during the conversion of sucrose, which is present in the original nectar, into dextrose and levulose by the enzyme invertase, which presumably is furnished by the bee. While these sugars have not all been identified as yet, their presence would account for a part of the so-called unidentified fraction of honey.

One of the sugars formed by honey invertase from sucrose, for example, is a trisaccharide consisting of two molecules of glucose and one of levulose. Its technical name is alpha-maltosyl beta-D-fructofuranoside (17), and it has been isolated from a honey invertase digest of sucrose in a yield of 11 per cent of the original weight of sucrose.

Further studies along this line will undoubtedly lead to further elucidation of the composition of the so-called "undetermined" 6 per cent of honey. In fact, by using a new procedure based on use of an absorption column for separating the sugars into three classes, as much as 98 per cent of honey constituents are accounted for.

A comparison of the various methods for determining dextrose and levulose in honey has been made by Dr. White and Miss Maher. Their findings (18) indicate that certain of the methods in current use give higher precision for both dextrose and levulose than others that were investigated.

It might be pointed out that these various methods give much more concordant results when applied to mixtures of pure sugars made up to simulate honey than they do when applied to honey itself. This would indicate that certain constituents in the so-called "unidentified" components of honey interfere with the determination of dextrose and levulose.

As more information becomes available on the nature of the components of this unidentified fraction, the influence they exert on the procedures for determining the sugars can be

taken into account, with resulting improvement in the accuracy of analysis.

A new procedure for the determination of the sugars of honey was developed after the inadequacy of existing procedures was demonstrated. Employing carbon column adsorption as a pretreatment, the new method has reduced the "unknown" fraction of honey from about five to six per cent to less than two per cent (19, 20).

Granulation Studies

ONE OF THE troublesome problems in preparing liquid honey for retail trade is that of granulation.

Damage to honey frequently results from drastic heat treatment which is customarily used to lessen its tendency to granulate. Then again unless heat or other treatment is sufficient to thoroughly remove all crystals or crystal nuclei, granulation may take place on the store shelf, with resulting loss to the storekeeper. There is also a granulation problem in the packaging of chunk honey surrounded by liquid honey. While granulation of honey has not been extensively investigated here because of the press of work on other problems, it is one deserving of thorough study because of its importance to the industry. Investigations have been made, however, which have resulted in a simple procedure (21) by which the honey producer or packer can detect early granulation in his product so that appropriate treatment may be given.

The principle involved is to view a sample through polarized light when any small crystals of dextrose hydrate present appear as bright objects against a black background. This makes them more easily seen than when viewed with ordinary light. While the absence of visible crystals when honey is examined in this manner does not guarantee that it will not crystalize later, in general honey showing crystals under polarized light should be reprocessed to avoid early granulation.

It is hoped that this procedure may be helpful to the honey packer in determining the proper degree of processing so as to avoid excessive heating and at the same time prevent a condition that would lead to early granulation in the container.

Progress has also been made in controlling granulation of chunk honey packaged in a container surrounded by liquid honey. By coating the chunks with an edible pectinate before they are placed in the liquid honey, inoculation of the liquid honey by crystals of dextrose hydrate from the comb surface is prevented and crystallization thereby delayed. It has not been determined yet whether or not the process is a practically feasible one.

Sterilization of Honey

Another problem that has been investigated to some extent is that of sterilizing foulbrood-infected honey by heat or a combination of heat and bactericidal agents so as to permit feeding it to bees without danger of spreading the disease. This work was carried out in close cooperation with the Bee Culture Laboratory of the Department.

Thermal death time studies on the spores of **Bacillus larvae** were carried out in order to provide a basis for a method for sterilizing honey (22). At an acidity of pH 3.0, the following heating conditions were required to reduce viable spore populations to less than 1 in 10 milliliters: 160 minutes at 212° F., 41 minutes at 230° F., 8.6 minutes at 250° F., 1.9 minutes at 269° F. and 0.64 minute at 284° F. Various sporicidal agents were also tested, but it was found that the only effective ones were too toxic to bees.

A process has been developed for treatment of honey so that it may be used for bee feeding without danger of spreading American foulbrood. It will be described in a forthcoming publication.

Present Program

ALTHOUGH the broad objective of our utilization investigations on honey remains the same, i.e., to develop new and expanded uses through chemical, physical and biological research, the specific problems being studied do undergo change more or less constantly. In general, about two years is allowed to complete a specific phase of work.

Since the technical staff conducting research on honey at present is small, only a limited number of problems can be studied at one time. At present

the principal fields of work being given attention are: increased utilization of honey in commercial cake baking; evaluation of dry honey-milk as an ingredient of prepared baking mixes; and improvement in methods of analysis of honey, which will lead to a better understanding of its composition and behavior.

Two of these problems, honey in commercial cake baking and evaluation of honey-milk powder, are being studied primarily through research contracts. There are, of course, other problems on honey that are in need of investigation, and these will be dealt with as rapidly as progress on the present program permits undertaking additional work.

Some additional problems on which research would appear to be profitable are: studies to develop increased uses of honey in the confectionery industry, use of honey as a humectant for cigarette tobacco, increased use of honey in pharmaceutical preparations, and studies on the granulation of honey.

There would certainly appear to be room for increased use of honey in candy manufacture, where comparatively little is used at present. Developing information about the types of honey best suited for candy making and overcoming some of the technical difficulties in using honey for this purpose should be helpful in stimulating this outlet. (Ed. note: See February through May Gleanings for a detailed report on Honey Candy.)

(Continued on page 635)

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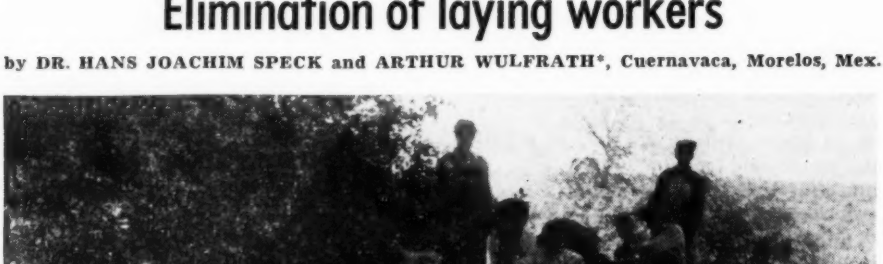
Elimination of laying workers

by DR. HANS JOACHIM SPECK and ARTHUR WULFRATH*, Cuernavaca, Morelos, Mex.



One "Miel Carlota" truck coming home with honey and our Indian helpers on top.

IN ARTICLES under "Asked and Answered" we found several ways mentioned to get rid of the laying workers. In one of your past issues you say as in other occasions before, that it would be best to unite such a hive with a queenright colony.

That will be right just before harvesting. In all the other times of the year we would not do that and not even before harvesting as we do not know any kind of uniting hives which works with security here during all hours of the day.

We use the newspaper method in our queen-rearing yard for swarm boxes about 300 times a year and never loose a queen as we are uniting the hives at sunset after the last bee has come home. Uniting hives during the day means loosing 40 per cent of the queens.

As we can't make a special trip to our out-apiaries to save a hive with laying workers or one with only old bees which would not accept a caged queen, we tried to unite these hives during the day with queenright colonies, separating them by two sheets of newspaper. The result was the same; also with three sheets of newspaper it seemed that in many cases the bees came down into the queenright colony only to kill the queen. Only with using four sheets was the queen safe because the bees in the upper hive were suffocated before they were able to perforate the paper.

Anyhow we do not like to reduce the number of our hives and uniting two hives means loosing one which also means loosing 170 pounds of "Miel Carlota" (honey).

Several years ago we tried the method we will describe now. We used it many hundred times and never saw a reappearance of laying workers without loosing a single hive.

Every year in the months of January and February we find many hives with laying workers or with old bees without queen and brood. We get most of our honey just after the rainy season in the last three months of the year. During

*The authors operate 4,000 colonies of bees near Mexico City.

that time we have to hurry to get the honey home and can't bother about the brood chamber. So we do not expect to find all our hives in good condition at the first inspection in the early year.

FINDING A COLONY with laying workers we take two frames from the center of the hive with all bees on it and put them against the super which we located behind the hive. Then we look for the queen in one of the other hives. Finding her working on a frame we give this frame to an assistant or hang it into an empty hive box. The other frames, less one, we put back into the hive uniting them on one side of it. That frame which should contain brood of all ages and the bees found on it we put against the super of that queenright colony.

Now we change the position of the two hives so that the laying workers are on the place of the queenright colony and this one on the place of the hive of laying workers. The supers and the four frames taken from the two hives stay on their place.

To make the colony of laying workers queenright, we give it the frame with brood and bees in one side of the space we left in the center. Then we add the frame on which the queen is walking. In that way she comes between the two frames which are occupied by her daughters. Now we give the super to the hive, the super which also is full of her own bees. Other members of her family come through the entrance so that in very short time all the bees will be peacefully mixed up.

The other hive which is now in the place of the laying workers gets in the empty side the two frames with laying workers and their brood. In a cage we introduce in the usual way a young fertile queen and give the super. That queen will be accepted as good as in any other colony where we took away the old queen in the moment of introducing the new one. At last we reduce the entrances of the two hives.

The queen in the hive with laying workers will go on laying and only one week later we scarcely will recognize the hive. It seems as if there never had been laying workers. Seldom will the queen disappear. The bees will react like normal bees. The laying workers disappear and the bees will rear a new queen from eggs or larvae of the two frames with the regular brood we gave them.

Until now we have not found out why the bees do not always accept the queen. Sometimes there must be some circumstances which are unfavorable for the acceptance of any foreign queen, caged or uncaged. When a greater percentage than usual of caged queens are not accepted, then also more than five per cent, very seldom 20 per cent, of newly introduced queens will disappear in the hive with laying workers or with old bees only.

It is important to find the queen on a frame with brood without making her nervous by touching her or by treating the hive with excess of smoke. When we do not find her walking on a frame we shut that hive and go to the next one.

Naturally it is not advisable to take the best queen of the apiary for the manipulation. We usually use a hive with an old queen. Then we let her work in the hive with laying workers three or four weeks, changing her after that time for a young fertile queen.

"We sell nothing but REAL fresh comb honey!"

B & Z Library

Observations of the hired man

by KERMIT WILSON, Manager, California Honey Advisory Board

[Here is the story behind the Honey Marketing Order being successfully operated in California.—Editor.]

WE HAVE BEEN receiving letters from various parts of the country asking us about our operations and what benefits we are deriving from our program. We thought we would answer some of these questions in this article.

In 1950, a majority of the producers and packers from all over the state voted to organize under the California Marketing Act of 1937. This legislation was enacted to assist any agricultural industry in combating disorderly marketing, improper preparation for market, unfair methods of competition, and inability of individual producers to maintain or develop new or larger markets. Through its provisions, the Marketing Order for Extracted Honey was issued by and under the authority of the California Director of Agriculture, March 1, 1952, and the California Honey Advisory Board was born.

About a year and a half ago the Honey Advisory Board made overtures to the Lima Bean Advisory Board, of which I was the Manager, to share managerial and office services. A satisfactory arrangement was worked out and since that time I have had the additional pleasure of working for two of the finest food industries in the state of California. Never in my experience have I met a more appreciative group of people than the beekeepers, honey bottlers, and packers.

The Board consists of the following members as well as their alternates: R. L. Hartman, Hemet; H. J. Crawford, Fullerton; Ray R. Reed, Los Angeles; H. J. Fredriksen, San Luis Obispo; H. M. Krebs, Fair Oaks; George T. Hansen, Alameda; N. M. Yeater, Chico; H. H. Schumacher, Alhambra; Wendell Shore, Los Angeles; and C. C. Gralapp, Colton.

Our Chairman is Ray Reed, who is a substantial beekeeper with his principal interest in Imperial Valley. Our officers are: Vice-Chairman, H. H. Schumacher, who is also Chairman of the Research Committee; C. C. Gralapp is Secretary. Hood Littlefield, beekeeper, and Wendell Shore, packer, are co-chairmen of the advertising committee. H. M. Krebs, formerly our state bee inspector, who got bitten by the beekeeping bug so badly that he is now a fulltime beekeeper, is Chairman of the budget committee.

Perhaps it was because of the struggle this Board had for about a year or so, first getting organized and then attempting to share management efforts and still engage in the production of honey or bottling and packing that this year and a half has been a most interesting one. Looking back over it, some very splendid progress has been made. That isn't to say that we don't have a long way to go, and there isn't much to be done, because there is. But at least some definite and satisfactory steps have been taken in the right direction which are going to have long-lasting benefits to the California honey industry, and we hope too, other producing areas clear across the country.

What has been done in advertising and sales promotion programs under the order?

Last fall we invested $13,000 in advertising in 50 newspapers with some home economics radio and television work. The theme was "Eat Honey More Often". Sales promotion work was done on the part of the dealers. No store or point-of-purchase material was used last year. However, we feel that something should be done along these lines this year.

We used both the services of the American Honey Institute and California Foods Research Institute, which prepared and distributed honey recipes every month to over 100 newspapers, radio and television stations, and magazines. They also produced six photographs of dishes using honey. The most outstanding was the Honey Blond Fruitcake which appeared in the Home Section of the Los Angeles Times, having a circulation of 800,000. This publicity costs us $3,000 a year and is limited to the state of California.

What has the Board done in the field of research?

A graduate student at the University of California at Davis, California, was employed and entrusted to explore the different types of California honey as to their diastatic value. Low diastase in U. S. honey threatens to impair the export of United States honey to several European countries. Since California contributes one-third of its production to export, the diastase matter is of great concern.

The purpose of the research at Davis, California, is to investigate and prove if possible that honey with low diastase should not necessarily materially affect the nutritional value of the honey, as it is now contended by nations of Western Europe.

How has the money been raised?

The money has been raised under a state assessment of ten cents a 60-pound can: five cents is paid by the producer and five cents by the dealer. Our total budget is approximately $42,000 this year, which includes some carry-over from previous years. The average total income per year is about $32,000. Under the Marketing Act, subject to Board resolution, we could raise this to 20 cents a can. However, the Board is proceeding cautiously. There is a possibility that next year the assessment might go to seven cents, which would be a total of 14 cents a can, but nothing definite has been decided.

What has been accomplished in the reduction of unfair practices?

Honey dealers are required by law to post their prices with the Honey Advisory Board ten days before they become effective to the trade. The main thing that this has done is to take the rumors out of the honey business. Upon request, any honey packer or dealer can obtain the price quotations of any firm selling five-pound cans or under. This includes, of course, advertising or any other allowances. So far this has worked quite well, principally because of the high caliber of the men that we have in the honey business.

Are there some "pitfalls" or situations to be on guard against in carrying out the type of program we have in California?

The success of this program is largely due to Mr. William J. Kuhrt, Chief of the Bureau of Markets, and his able staff. He has the responsibility of administering 32 of these California agricultural marketing orders. He is a man of wide experience and a keen student of human nature. He is readily accessible to the board managers and others concerned with marketing problems.

When I first took over this job, I was a little leery of "bureaus". However, I find that the state collects the money and pays the bills on order from the members of these boards. They have kept us out of a lot of trouble.

We have access to the Attorney General's office and all of our contracts with outside services such as advertising, publicity, or research are carefully scrutinized to see that we don't get into a situation that is unwise. With over 20 years of experience, the Bureau of Markets is able to render real service. So, the only "pitfall" I can see for an industry such as ours would be to get themselves tied up with an inexperienced administration.

After a little over two years under the California Marketing Act, I have seen competitors—both dealers and beekeepers—independent and co-op—develop new confidence and co-operation. They have ceased thinking on an individual personal basis, and now think in terms of what's good and needed for the California honey industry and the national honey industry.

As the "hired man" I feel it has been a real privilege to work with our California honey people. They are high grade folks. They have expressed gratifying appreciation to me and my staff for what we have done. We feel that we have merely tried to do our job.

Prepare now for 1954 National Honey Week. October 25th to 30th.

Know your labels

by CHARLES W. GOUGET, Glen Ellyn, Ill.

FEW OF US will mistake the trademark of Coca Cola as a pleasing drink, or the trademark of Jell-O as a pleasing dessert. They both bring to mind pleasant experiences which create a desire to purchase the article represented. For this reason trademarks are worth millions of dollars to companies using them, and so they are selfishly guarded.

In a like manner your honey label is your trademark; it represents you and your product and as such it may increase or decrease your sales, or just do nothing for you.

Selecting a Label

With the growth of self service in stores a package must be attractive, and in addition, it must be a forceful advertisement of the article to be sold. To sell the best, the product must be readily recognizable, and of course, produce a favorable impression when seen and inspected by the buyer. Good art work and pleasing design and color are therefore essential for all good labels.

The size and shape of the label in relation to the size and shape of the container; its position on the container, and the emphasis that is placed on the product are all factors that attract the attention of the buyer.

As in the case of Coca Cola and Jell-O a label should produce a pleasant response in the prospective buyer, when possible, through an appeal to some inner need such as health, hunger, or work saving. Therefore, it is very important to know who most of the sales prospects are: that is, are we selling mostly to women, men, or children; to the leisurely class or to the working classes?

Obviously the approach will be different for honey or pancake flour than it would be for Peacock Jewelry because the appeal must be made to a different class of people.

Color of the Label

COLOR ATTRACTS attention which may arouse further interest because of its soothing effect, or it may cause attention to shift because of the irritating effects on the individual.

A large label on a small jar covers most of the jar, shuts out most of the light, often wrinkles at the outer edges, and prevents the honey from being seen in the jar. In addition, the print-

GOOD: A good label will conform to the style of the bottle. It will be proportional to the size of the bottle and artistically placed. Pleasing design and color will attract much attention.

NOT GOOD: Labels placed too high or too low on the bottle are off balance and often irritating to look at.

ing may be all out of proportion to the size of the jar, the whole thing presenting a very crude, amateurish appearance to the customer.

The other extreme is a very small label on a very large jar. In this case the jar is outstanding and "gobbles" up the label which is too small to be read at any reasonable distance, consequently the customer may not know what the jar contains and pass it by unnoticed.

A good label will be in proportion to the size of the jar, not too large nor too small, nor placed too high nor too low on the container. It will have appeal because it is artistic and suited to the style of the bottle. The colors too will be pleasing, and above all the theme "Honey" will be the most prominent thing on the label: clear, distinct and suggestive of something good to eat. Like any trademark it can be a forceful advertisement, and your best salesman. Know your labels!

Reds, yellows, and blues are the colors that are most used, but these too should be used in pleasant shades. Labels overdone in intense reds, or dark blues, or greens, are not pleasing in appearance and may attract attention to the unpleasant color rather than the theme "Honey" originally intended.

If possible the color selected should be suggestive or symbolic of the product sold. For honey, gold or golden yellow colors are pleasant and suggestive of pure, "golden" honey.

In addition, the grocer or dealer will appreciate a label that will not soil or fade easily since both dirt smears and faded labels give the honey an "aged" appearance.

Emphasis

Since we must assume that it is necessary for our product to sell itself, nothing must detract from the general theme "Honey" because both design and emphasis should make for easy identification, and easy identification is an aid to "impulse" buying. A product that is lacking in identity has little chance of obtaining a very wide distribution.

Where the label permits, advertising may be helpful to build up a preference for the product. For example, it could be stated: "Honey is an energy producing food containing vitamins B

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POOR: A small label on a large jar emphasizes the jar and not the product, and since the label cannot be read easily the identity of the product may be overlooked.

VERY POOR: A large label on a small jar shuts out light, prevents the honey from being seen to any extent, and makes it appear much darker than it really is. Because of its size the label often wrinkles and the printing is out of proportion to the size of the jar.

Let's talk about honey plants

by HARVEY B. LOVELL, University of Louisville

Chapman honey plant or globe thistle.

I SPENT THE last half of August in southern Maine in a cottage on a lake shaded by pine trees. I found honey bees visiting a surprising number of flowers in the surrounding country including spreading dogbane, Joe-pye-weed, goldenrod, aster, burdock, Japanese bamboo, Canada thistle, thoroworth, and several others.

I spent one day at my old home in Waldoboro where my father, John H. Lovell, carried on his studies on bees and honey plants over half a century. The Chapman honey plant or globe thistle which my father had planted many years ago had spread freely and was in full bloom. The large globular clusters of blue flowers were alive with honey bees.

Many years ago when Hiram Chapman planted three acres of the globe thistle, there was great interest in this new honey plant and many beekeepers hailed it as the find of the century. However, C. C. Miller wrote in Gleanings, that after watching the bees working the flowers, he had decided that the bees were actually not getting much nectar after all, but "were in large part idle". The bees did not look idle to me. They did remain for several seconds in each flower but that I am certain was because of the large amount of nectar. I then collected a series of bees and found that nearly all of them had a large drop of nectar in their honey stomachs. With a refractometer, I obtained an average reading of 26 per cent sugar in the nectar. Although this is not as high a percentage as found in some flowers, it compares very favorably with many. It was, in fact, sufficient to attract hordes of honey bees—many heads had three to four bees at once—all of whom were as busy as "bees" should be.

I concluded that C. C. Miller had made insufficient studies and that the evidence was against his conclusions.

Because of the attractive appearance of Chapman's honey plant, I strongly urge beekeepers to plant it as an ornamental around their homes and in waste places. It comes back year after year with little or no care.

Red Clover. There has been so much dispute over honey bees and red clover that it seems worth while to record some observations I made recently. In Dover, New Hampshire, there were several acres of red clover and alsike clover growing in the same field. Honey bees were fairly numerous on the alsike, but an hour of watching failed to catch a single visit by them to the red clover. On the other hand, the red clover was being worked pretty thoroughly by bumblebees belonging to at least three species (**Bombus affinis, impatiens,** and **vagans**). I collected several of these bumblebees and found that most of them had well-filled honey stomachs. My refractometer gave a 31 per cent sugar content to the nectar.

On the way back from Maine on September 1, we stopped at the apiary

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FROM Foreign LANDS

New Use for Honey

BERNARD GILL of England reports that it has always been customary to add a little honey to water color pigments when the colors are being ground. This practice dates back to the old masters who also used gum acacia as a medium following a 5000 year old Egyptian tradition.

The levulose in the honey gives the necessary flexibility to the paint since it is non-crystalline. Now that water colors are sold as a paste in tubes it is more important than ever to use a hygroscopic substance as an ingredient. The author points out that glycerine has been tried for this purpose, but it increases the risk of fading in the completed picture.

British Bee Journal.

Preserving Pollen

ALIN CAILLAS urges all pollen-collecting beekeepers to be careful to place pollen traps where they are sheltered from rain and dampness for even under the best conditions pollen contains about 18 per cent moisture. This moisture has been added by the bees themselves for pollen is enveloped by a small quantity of nectar which helps the pollen mass to stick together.

If the above conditions are observed then pollen collecting can be reduced to twice a week. Failure to meet these conditions will necessitate the daily removal of pollen especially if the outside temperature is fairly high. Fermented pollen can rapidly become toxic.

To preserve the pollen for future use it must be properly dried. Spread the pollen out onto a newspaper but be certain that it is not more than a quarter of an inch thick. This should take place in a slightly darkened room having an even temperature. Stir the pollen once or twice daily and spread it thinly again so that all of the pollen is exposed to the air for drying.

Infra-red lamps placed about 12 inches away from thinly spread out pollen will penetrate to the interior of the pollen grains and properly dehydrate the mass. One infra-red lamp is needed for every half pound of pollen. The temperature generally reaches 113 to 122 degrees F. It takes about eight hours to complete the entire operation with the infra-red lamps. Then the pollen should be hermetically sealed and stored in a dry place.

La Belgique Apicole.

Insufficient Cell Space Causes Dwarf Bees

DR. R. Buchner, of the Zoological Institute in Munich, Germany, reports that old foundation can cause dwarfing of bees. He experimented with foundation used 68 times and found that old cocoons remaining in the cells narrowed these cells to such an extent that bees hatching from this foundation were midget bees with a weight one-fifth less than normal.

Nurse bees are able to raise one generation of bees on sugar syrup alone without honey or pollen whatsoever but they have to draw on their body reserves, which, however, only last about 14 days. Field bees forced to raise larvae are unable to raise normal bees. Only after some time when their shrunken royal jelly glands were activated again were they able to raise normal brood.

An interruption in the care of the brood can be catastrophic. Even an hour withdrawal of food damages larvae to such an extent that hatching bees are one third lighter than their normally fed sisters. Lack of sufficient room and food also influences tongue length, size of wings, and also impairs the bees' ability to regulate the hive temperature.

These tests show that too old foundation as well as interference in normal breeding will impair young bees and eventually the whole colony.

Deutsche Bienenwirtschaft.

Editorials

National Honey Week

IT IS NOTED from the calendar that **National Honey Week** this year begins October 25. This week of special emphasis on honey promotion was started by the American Honey Institute, Madison, Wisconsin, some years ago.

Obviously, the purpose is to concentrate on publicizing and selling honey during that week which comes at a time of year when people are naturally thinking about honey.

Those who have honey to sell should take advantage of the printed matter put out by the American Honey Institute and supplied to beekeepers at a nominal cost. Honey recipes, cook books, leaflets, and attractive counter cards are available for those who wish to prepare window displays during Honey Week.

Anything that can be done during **National Honey Week** to make people more honey conscious and to increase honey sales will benefit our industry. Let's cooperate with the American Honey Institute in trying to raise the per capita consumption of honey to a higher level. The Institute, under the able direction of Mrs. Harriett M. Grace, is doing a marvelous work. Let's give the Institute our moral and financial support.

Don't Neglect Your Bees

IN SOME SECTIONS of the country where drouths prevail and the honey crop has been short, there may be a tendency on the part of some beekeepers to neglect their bees. It really is discouraging not to secure surplus honey after having expended a considerable amount of labor on the bees during the season.

It does require some optimism to buy sugar in order to feed the bees to supply winter stores. However, this is the only thing to do, if we wish to remain in beekeeping. It is possible, of course, to wait until next spring to install packages with queens in hives in which the bees died during the winter because of lack of food.

As a rule, one extreme follows another. Next season may be very favorable for the production of honey, and if we let our bees die and fail to install packages early next spring we may fail to secure a good crop of honey.

We hope, therefore, that all beekeepers may give their bees proper management this fall which means providing an adequate amount of stores for each colony and the necessary protection against the elements where the winters are cold.

If, perchance, colonies have dwindled in strength, due to the lack of honey and pollen to maintain brood rearing, it would seem preferable to unite these understrength colonies or to gas them and install packages in the spring. There would be nothing to gain in attempting to winter colonies that are weak in bees or do not have a high percentage of young bees.

Beekeepers in areas where goldenrod and aster are found, will likely secure enough honey for winter stores and possibly some surplus.

If sugar syrup is to be fed, the feeding should be done before cold weather comes so that the bees may have an opportunity to arrange the food in their brood nests and ripen it properly.

Destroying Roadside Bee Forage Bad for Beekeepers

IT WOULD APPEAR that some states have gone all out for killing off bee forage on roadsides. At one time there was a considerable amount of sweet clover, as well as other clovers growing on roadsides and this constituted a considerable amount of forage for bees. At present it is seldom that any sweet clover is seen on roadsides, except possibly on some back or crossroads away from main highways. Some of these places are also being denuded.

Since roads or highways constitute a considerable amount of the land in any given area, it is obvious that when clovers and other nectar and pollen plants are removed beekeeping is dealt a severe blow.

We can understand why it is necessary to have forage removed at intersections where it is necessary to have a good, clear view of oncoming cars. However, we are unable to understand why such plants as clovers growing on roadsides are destroyed. So long as they are not permitted to grow too close to the pavement, they are likely to serve some useful purpose such as beautifying the highways and preventing erosion of the soil that sometimes occurs during heavy rains. Some forage along the highways furnishes coverage for useful birds that help to keep down the destructive insect population. Useful pollinating insects, such as bumblebees and solitary bees are afforded some protection.

If beekeepers' associations, both state and county, would give some attention to this matter and appoint committees to approach the right people in an attempt to correct this roadside situation perhaps something could be done about it.

It is possible, of course, that we beekeepers see only our side of the question. However, if there are good valid reasons why roadsides should be denuded of useful forage for bees, we as beekeepers are willing to listen.

Man, Bees Worst Enemy

IT IS A WELL-KNOWN fact that there are common enemies of honey bees such as skunks, bears, toads, also certain birds that catch bees in the air as they fly to and from hives. Adult and brood diseases which are common may be said to be enemies of bees. Some progress is being made to combat them.

It has been said that man is the bee's worst enemy. Is this actually true?

Bees have been on this planet for many centuries and managed to live, even before man attempted to manage them. Man has done much to help propagate bees in order to produce surplus honey and wax. Considerable progress has been made since the movable-frame hive was invented a little over 100 years ago and after comb foundation and the honey extractor began to be used.

However, from the standpoint of applying intelligent management to bees, to have them store a maximum crop of honey, man still has much to learn.

Swarms of bees in trees are likely to live for many years, mainly because the bees are not tampered with and honey is not taken away from them.

Since the movable-frame sectional hive came into use, some owners of bees remove too much honey and do not leave enough food for the bees during the winter and early spring. In many instances, bees die from starvation during the winter. More bees die from starvation than from any other cause.

Then too, owners of bees, especially beginners, may rearrange the combs in brood chambers of hives late in the season, after the bees have placed honey and pollen in the combs to their liking in preparing their winter brood nests. Such interference usually results in the loss of colonies during the winter because it is impossible for the bees to adjust themselves to the changes so late in the season. In such cases, beekeepers are unknowingly enemies of their bees.

Beekeepers should find out just what their bees need and see to it that the needed requirements are present. If all beekeepers would cooperate with their bees in making it possible for them to do their best work, it could then be said that beekeepers are friends rather than enemies of their bees. Furthermore, larger crops of honey and wax would be secured and beekeepers would enjoy a wider margin of profit.

Honey bees as pollinators of greenhouse tomatoes

by R. B. NEISWANDER, Ohio Agricultural Exp. Station, Wooster

A honey bee collecting pollen from a tomato blossom.

MANY HOME gardners grow tomatoes each year without realizing that a process known as pollination must take place before fruits will develop. In the crop out of doors, nature accomplishes this process effectively. Insects of various kinds visit the blossoms and the plants are vibrated by winds. Inasmuch as the blossoms are self fertile, the pollen needs only to be shaken from the anthers to the stigma. In other words, the pollen needs to be transferred from the portion of the flower on which it develops to that portion which later develops into a tomato.

It was learned nearly 50 years ago that tomatoes grown in a greenhouse need special attention to insure that this transfer of pollen is done properly.

The following statements are quoted from Ohio Extension Service Bulletin SB-10 which was published in March, 1954: "Greenhouse tomatoes must be hand pollinated in order to assure a good set of fruit. This involves tapping each flower cluster to transfer the pollen grains from the anthers to the stigma. Since all flowers in a cluster do not open at once, it is necessary to continue tapping the cluster as long as there are open blossoms. The electric vibrator is the most widely accepted tool for tapping the flower cluster early in the season. Later on, as light increases and pollen is shed with greater ease, a fair job is accomplished by merely shaking the plant or striking the supporting wires with a well-padded stick. However, this method is not as effective as the electric vibrator in cloudy weather."

Inasmuch as 9,000 or more plants are grown per acre in a greenhouse and approximately ten blossom clusters develop on each plant, at least 90,000 blossom clusters need special attention three or more times during the growing of a one-acre crop. This, of course, involves a tremendous amount of labor. Consequently, on a request from the Ohio greenhouse tomato growers, the writer undertook a project at the Ohio Agricultural Experiment Station to investigate the possibility of inducing bees to do this work.

A Knotty Problem

As long ago as 1907, horticulturists working with greenhouse tomatoes in Michigan stated in an Experiment Station Bulletin: "We have never heard of bees being used successfully for distributing tomato pollen, although they work well on cucumbers." In 1928 a horticulturist at Cornell University stated: "Honey bees which facilitate pollination of greenhouse cucumbers, do not work on tomato blossoms, probably because of the peculiar structure of the flower and the absence of nectar."

It has been known for many years that the amount of pollen which reaches the stigma of a tomato blossom has a marked effect on the size and shape of the resulting fruit. When but a few pollen grains reach the stigma, small fruits, and often irregularly shaped fruits result. These are usually very solid and have few if any seeds.

An occasional honey bee has been observed to approach a tomato blos-

som and touch it with her mouth parts, but not alight on it. Such action is likely to result in small fruits with few seeds. A certain amount of training or a special method of feeding appears necessary to induce bees to collect pollen from tomato blossoms if bee pollination of greenhouse tomatoes is to be successful.

Those who have studied the pollination of greenhouse tomatoes emphasize the importance and influence of sunshine, high temperatures, and dry atmosphere on the formation, liberation, and germination of pollen. These are the conditions in which bees are most active, and bees should be efficient pollinators when these conditions prevail, but the problem of pollinating tomatoes during cool and cloudy weather becomes even more troublesome when dependence is placed on bees. However, the stigma of a tomato blossom is thought to be in condition to receive pollen for a period of four or more days.

Habits of Bees Need Consideration

A BEEHIVE is a complicated society and various groups are assigned specific tasks which they perform exclusively. Apparently a relatively small group of bees are designated as foragers. It is their duty to search for new sources of food. When foragers locate a food supply they carry some of the food back to the hive and feed it to the larger group of workers, and by a peculiar dance indicate where the food came from. Observations have shown that they indicate not only direction but distance as well. The worker bees then go directly to the new source of food.

Worker bees that are gathering food rarely go from one species of plant to another while on one trip from the hive. In fact, one individual usually continues its visits to one plant species for several days or as long as the food supply is adequate. Bees, of course, collect nectar, pollen, and propolis, but an individual bee collects only one thing at a time. It seems probable, therefore, that if bees can be trained to visit tomato blossoms for pollen, they should continue to do so, particularly if no better supply becomes available.

Experimental Work with Honey Bees

In the entomology greenhouse at the Experiment Station honey bees were used as pollinators for the fall crop of tomatoes in 1952, both the spring and fall crops of 1953, and the spring crop of 1954. Two small rooms were available for these experiments. In one room the crop consisted of 72 tomato plants and in the other 84.

Half of the plants in each room were marked with a red streamer and the blossom clusters on the plants so marked were vibrated with an electric vibrator at intervals of one or two days. No effort was made to pollinate the flowers on the other plants, other than to introduce bees. However, some pollination occurred while the plants were being pruned and trained up the supporting twine. The bees of course had access to all plants.

Bees were maintained in the greenhouse throughout both winters of 1952-'53 and 1953-'54. Inasmuch as the tomato blossoms contain little or no nectar the bees were given constant access to a sugar solution. They were also fed a pollen supplement when tomatoes were not in bloom, but this was removed when tomato blossoms became available in an effort to induce them to visit tomatoes for pollen.

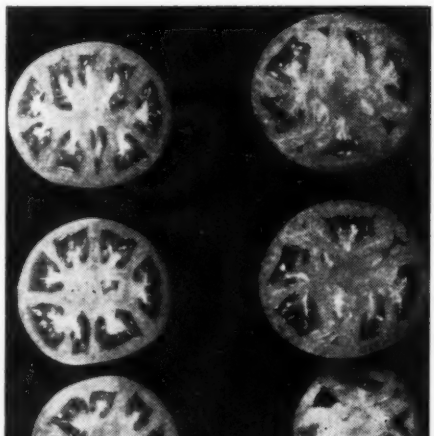
Sometimes tomato blossoms were crushed in a shallow dish of sugar solution and occasionally a few drops of sugar solution were placed on blossoms on the experimental plants in an effort to attract the bees.

When treated in this manner the bees were observed at times to work vigorously on tomato blossoms. As indicated above, the degree of activity is influenced greatly by a number of factors. Factors that were found to be important but not mentioned previously are the health and vigor of the bees in the hive. At one time the bees were removed in the evening and the tomatoes treated with a malathion aerosol in order to control a severe infestation of whitefly that had developed on the plants. The rooms were aired next day before the bees were returned. Although few if any bees were killed by the poison their activity stopped almost completely. No appreciable activity was observed until queenless bees were added three weeks later.

A difference in the action of different strains of bees was also observed. Caucasian bees seemed to work more actively and at lower temperatures than others used. They were observed on tomato blossoms several times when the temperature was as low as 65 degrees F.

For the first two crops, bees were introduced into both rooms in which tomatoes were grown. For the third and fourth crops, however, bees were used in only one of the two rooms, but since the rooms are separated only by a narrow hallway and both doors were left open constantly, the bees worked both rooms readily although to a somewhat greater extent on the tomatoes where the hive was placed.

A careful record was maintained of the number and weight of tomatoes picked from each plant. The data obtained from the fall crop of tomatoes grown in 1952 and the spring crop of 1953, when a hive of bees was used in each room, are summarized in Table 1.



The tomatoes on the left were pollinated primarily by bees and those on the right with an electric vibrator. The small number of seeds would be desirable, but such fruits average smaller than those pollinated more completely.

Table 1. Tomato Yield—Fall Crop of 1952 and Spring Crop of 1953.

How Pollinated	Fruits Per Plant	Pounds of Fruit Per Plant	Weight Per Fruit - Ounces
Fall Crop of 1952			
Clusters not vibrated — Bees present	19.4	4.0	3.3
Clusters vibrated — Bees present	20.8	5.0	3.8
Spring Crop of 1953			
Clusters not vibrated — Bees present	27.1	6.1	3.6
Clusters vibrated — Bees present	29.5	8.2	4.4

In both crops a higher yield was obtained where the blossom clusters were vibrated mechanically. Also the fruits were somewhat larger on such plants. However, the bees visited the blossoms of all plants, and no measure of their effect on the yield of plants where blossom clusters were vibrated was available.

The data obtained from the fall crop of 1953 and the spring crop of 1954 are summarized in Table 2. In growing these crops, bees were maintained in only one of the two rooms. They worked chiefly on the plants in the room where the hive was located, but occasionally were observed in the other room also.

AGAIN BEST yields were obtained where the blossom clusters were vibrated with an electric vibrator. Plants pollinated with a vibrator in the room without bees produced approximately two pounds of fruit per plant more than the plants pollinated primarily by bees. However, the yield of 9.9 pounds of fruit per plant produced by pollinating only with bees in the spring crop of 1954 would amount to 44 tons of fruit (11,000 8-pound baskets) per acre if planted at the normal spacing. This represents a yield that is larger than the average crop produced commercially.

Of the plants pollinated with an electric vibrator, those in the room where the bee hive was located produced the highest yield. This may have occurred because the bees effected a more complete pollination.

The increase in one crop was .3 and in the other .7 pound of fruit per plant. On an acre basis these increases would amount to 2,700 and 6,300 pounds of fruit per acre respectively.

It is interesting to note that the size of fruits is closely correlated with the size of the crop. This seems to be rather good evidence that the differences in crop size were due primarily to differences in pollination efficiency.

Table 2. Tomato Yield—Fall Crop of 1953 and Spring Crop of 1954.

How Pollinated	Fruits Per Plant	Pounds of Fruit Per Plant	Weight Per Fruit - Ounces
Fall Crop of 1953			
Clusters not vibrated — Bees not present *	14.0	2.5	2.8
Clusters not vibrated — Bees present	16.0	3.0	3.1
Clusters vibrated — Bees not present	24.6	5.1	3.3
Clusters vibrated — Bees present	26.9	5.8	3.4
Spring Crop of 1954			
Clusters not vibrated — Bees not present *	47.4	8.0	2.7
Clusters not vibrated — Bees present	41.9	9.9	3.8
Clusters vibrated — Bees not present	37.3	11.7	5.0
Clusters vibrated — Bees present	39.0	12.0	4.9

* Although no effort was made to pollinate these tomatoes, a few bees found the blossoms. Also some pollination occurred when the plants were pruned and fruits were picked.

It was observed by horticulturists 50 years ago that poor pollination results in small fruits with few seeds. Differences in the number of seeds in poorly and well pollinated fruits are evident in the accompanying photograph.

It has also been known for many years that vigorous tomato plants which produce only a few small fruits in the early clusters tend to produce more blossoms and fruits in those that develop later. This was evident in the spring crop of 1954. The plants that were not readily available to bees and were not pollinated with a vibrator produced the greatest number of fruits. Many of these fruits developed after the early fruits began to ripen and no doubt some inadequate pollination occurred when plants were disturbed by the picking of ripened fruits. This condition was not evident in the two fall crops because the plants were removed earlier and fewer blossom clusters developed. This also explains in part at least the relatively small crops that were produced in the fall.

The results with bees as tomato pollinators have not as yet been adequate to warrant the suggestion that bees replace the electric vibrators. However, where vibrators are used, it is probable that the degree of pollination can be increased by the presence of bees. Consequently, the use of bees as supplementary pollinators of greenhouse tomatoes may be warranted.

Inasmuch as the greenhouse where these experiments were carried on was quite small, the amount of pollen produced was inadequate to meet the needs of a strong hive of bees. For that reason better results might be obtained in a commercial greenhouse where more plants are available. It is possible also that with more experience in the feeding, training, and care of the bees, they may be induced to visit tomato blossoms more frequently and thus effect pollination more efficiently.

It's An Idea

"Will Help to Eliminate Junk Combs"

by MILTON STRICKER, Annandale, N. J.

NEW JERSEY beekeepers find that eliminating 10 per cent of their junk combs each year is good crop insurance. While inspecting, the combs containing an excess of drone brood are marked with a thumb tack and put into supers to be extracted. Easily noticed during extracting time, they are eliminated from the apiary.

On the back of the smoker, a Kodak 16 mm film can containing thumb tacks is fastened. A small hole is cut in its lid and with a flick of the thumb, the thumb tack can be dispensed when you need it.

Come ona my house

by MRS. BENJ. NIELSEN
Aurora, Nebraska

Honey crisp coffee cake.—
Photo courtesy Kellogg Co.

"COME OVER for coffee" has a much more intriguing sound now that fall's crisp invigorating weather has pepped up heat weary bodies. Now don't tell me you enjoy summer—not the widespread enervating kind we have had this year. No one really enjoys 114 to 120 degrees temperatures! Of course, we did have coffees. People do travel and visit and must be feted. But how much more enjoyable it is to have a coffee now!

And with honey-way goodies always on hand it is so easy to have a "spur-of-the-moment" coffee. Baked goodies keep freshly moist and flavor actually improves with a bit of waiting.

You will like to serve this delightful honey coffee cake piping hot from the oven, so reach for the old honey jar and sing out, "Come ona my house."

Honey Crisp Coffee Cake

One and ½ cups sifted flour, 2 teaspoons baking powder, 1 teaspoon salt, ¼ cup shortening, ¼ cup honey, 1 egg, and ⅔ cup milk.

Sift together flour, baking powder, and salt. Blend shortening and honey; add egg and beat well. Stir in sifted dry ingredients alternately with milk, being careful not to overmix. Spread in greased 9 x 9-inch pan.

Topping

One cup sugar coated corn flakes, 3 tablespoons soft butter, ¼ cup honey, ¼ cup shredded coconut, and ½ cup crushed coconut.

Crush sugar frosted flakes slightly. Blend butter and honey; stir in shredded coconut, pineapple, and crushed flakes. Spread over batter. Bake in moderately hot oven, 400 degrees F., about 35 minutes.

Orange Honey Cake

Two cups sifted cake flour, 3½ teaspoons baking powder, ¾ teaspoon salt, ½ cup butter or shortening, 2 eggs, ½ cup sugar, ⅔ cup honey, and ½ cup orange juice.

Sift flour once, measure, add baking powder and salt, then sift together three times. Cream butter thoroughly, add sugar gradually, and cream together until light and fluffy. Add honey. Blend. Add egg yolks, and beat thoroughly. Add flour, alternately with orange juice, a small amount at a time, beating after each addition until smooth. Fold in egg whites, stiffly beaten. Bake in two greased 9-inch layer pans in a moderate oven, 350 degrees, 30 to 35 minutes. When ready to serve put together with and top with honey sweetened whipped cream.

Honey Date Nut Bread

One cup cut dates, 1 cup boiling water, 1 tablespoon butter, 2 cups sifted flour, 3 teaspoons baking powder, ½ teaspoon salt, ⅔ cup honey, 1 egg, and 1 cup chopped nutmeats.

Combine first three ingredients, cover and cool. Sift flour, baking powder, and salt together. Beat honey and egg together and add to dates, alternately with sifted dry ingredients. Add nut meats. Pour into greased loaf pan. Bake in slow oven, 325 degrees F., 60 minutes. Turn onto cake rack to cool. Flavor improves after standing 24 hours.

Honey Cheese Apricot Sandwich Filling

One-half cup dried apricots, 1 cup water, 2 tablespoons honey, 3 ounces cream cheese, and a dash of salt.

Wash apricots; cut into pieces and add water. Cover and simmer 10 minutes. Add honey to cool. Cream cheese with apricot sauce and add salt. Makes 1½ cups.

Bee Facts

(A Digest of Scientific Research)

Insecticide Appears in Nectar

SCHRADAN (OMPA) one of the new systemic insecticides was sprayed on mustard and borage plants in the greenhouse. The material was found in the nectar a few days after spraying and remained present but in lesser quantities for a month after the application. The highest concentration found was 21 parts per million. The material remained stable when placed in contact with the honey stomach of the bee and also when in contact with the enzyme invertase. Schradan when placed in honey remained stable for a period of two and one half months.

Schradan has a reported low toxicity insofar as honey bees are concerned and the authors project the thought that the material could very easily be found in honey collected from flowers sprayed with the material with no effect on the honey bees. It is suggested that three parts per million might be permissable in food products in England.

Glynne Jones, G. D. and W. D. E. Thomas Experiments on the possible contamination of honey with Schradan. Annals of Applied Biology 40: 546-555. 1953.

Control of European Foulbrood

STREPTOMYCIN fed at the concentration of 0.2 gram per colony at each feeding has given good control of European foulbrood, according to Joseph O. Moffett of the Colorado Agricultural Experiment Station. The streptomycin was dissolved in one and two thirds quarts of syrup and fed to colonies once every seven days for a two-week period.

"TM-5, a terramycin animal mix containing five grams of terramycin per pound, gave good control of European foulbrood when dusted over the tops of brood frames. TM-5 was mixed with an equal amount of powdered sugar, and 30 grams of this mixture were dusted over each colony. The colonies were dusted three times, a week elapsing between each dusting."

Three grams of Terracon 25 or 3/5 of a gram of streptomycin (material contained 33 ⅓ active streptomycin) is a good E.F.B. preventive if fed to colonies three weeks prior to the normal outbreak of the disease. Two weeks later a second feeding should be given.

Moffett, Joseph O. The Use of Antibiotics in Controlling European Foulbrood of Honeybees. Colorado Agric. Exp. Sta. Bull. 53. April 1954.

Pollen Substitute Patented

AN AUSTRALIAN patent (141,203, May 14, 1951) was issued for a pollen substitute for bees. It contains soybean flour 22 pounds, defatted wheat germ 0.673, aleurone grains 15.9, inactivated yeast 5.5, sucrose 43, dark honey 59.3, water 23.7; manganese glycerophosphate 0.34 grams, $MgCo_3$ 4.61, $FeSO_4$ 3.75, Ca lactate 9.2, NaCl 34.55.

Chem. Abstracts 48:7214 (June 25) 1954.

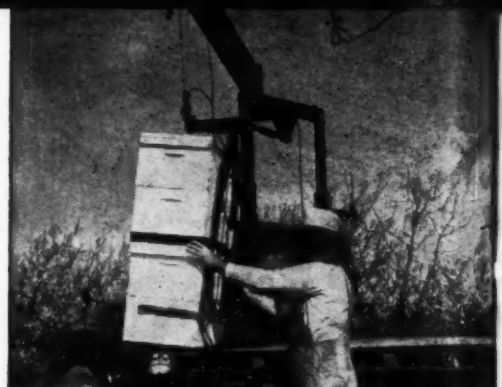
Bee Sting Sensitivity

"THE AUTHOR presents three case histories of patients, two of whom suffered from bee stings, and one from sand-flies. In all three patients, passive transfer sensitivity to normal skin was positive, and the clinical picture and the response to treatment proved the reactions to be typically allergic. The two patients sensitive to bee stings were desensitized by the use of commercial bee venom, the initial doses being as dilute as 1:800,000, with gradual increases until the patient gave no response to the 1:10 and 1:5 concentrations. When the patient was subsequently stung by a bee, there was only a slight local reaction, proving desensitization to have been successful. —E.A.B."

Visani, A. Hypersensitivity to the Stings of Bees and Sandflies. Abstracted in Quart. Rev. Allergy & Applied Immunol. 8:141 (June) 1954.

Mechanical aids

by J. E. ECKERT,
University of California, Davis



BEEKEEPING HAS been one form of occupation that has required a considerable amount of heavy lifting and many beekeepers have suffered with back trouble as a result. During the past few years several California beekeepers decided to see what they could do to take the backache out of beekeeping and, at the same time, reduce the cost of operation.

Wages are so high in other forms of mechanical work, that most beekeepers are finding it difficult to compete at the present prices of honey, beeswax, and pollination services. Skilled labor is hard to get especially when it involves night work and heavy lifting.

A number of designs of hive loaders were displayed at the annual meeting of the California State Beekeepers' meeting in 1952 and twice the number at the 1953 meeting in San Jose. Since then, still other types have been perfected or some of the original ones have been improved.

Two forms of power are being used, six volt or 12 volt batteries, or hydraulic power, either separate from the moving truck, or where the power of the engine is used to operate the hydraulic motor. A majority of the hive loaders are utilizing battery power.

Most of the fork lifts require cleats on each lower hive body, which means cleats on all hive bodies because of the necessity for interchangeability. Those who do not use cleats, have designed fork lifts which utilize the handholds in the ends of the hive bodies and the weight of the hive lifted to hold the fork in place. One type of this fork was made for a group of beekeepers in southern California to use with their hydraulic hive loader.

This loader is unique because it has built-in leveling devices to make the boom level when the truck is being loaded on uneven ground. The power unit is to lift and to lower the load which is pushed along the boom to its place on the load. It is no easy job to push a heavy load uphill, even though it rolls along on ball bearing rollers. (However, it is much easier to do so than to load a heavy two-story hive by "back power").

The boom on the hive loader shown in the illustration can be leveled from side to side by raising one side of the movable support higher than the other side and leveled lengthwise by turning the large turnbuckle that supports the end of the boom with the framework.

The fork lift is made of thin steel bars, welded together to make a hollow framework in which the wires are run to the three sets of control buttons which are placed at different levels. This arrangement makes it possible for the loader to lift one two-story hive onto another and then to lift both onto the truck without stooping.

Steel discs are welded to spring steel with the disc extending through a slot on each prong of the lift. The discs slip along the side of the hive and drop into the groove or handholds on each side. The cable pulls the fork prongs tightly against the sides of the hive, holding the fork securely in place. The pressure is released when the hives are set down. The fork shown also folds up so that the fork lift can be held tightly in place at the back of the truck bed. On some fork lifts the centerpiece can be extended to accommodate three two-story hives at one time.

Lights are placed on the end of the boom to enable the operator to load or unload at night. Yellow light will attract fewer bees than a white light.

American Honey Institute News Notes

by HARRIETT M. GRACE, Director
Commercial State Bank Building, Madison 3, Wisconsin

The Beekeeper—A Lucky Person

THIS IS THE time of year when beekeepers have a perfect right to claim for their own the title of "Beekeeping—Ideal Way to Earn a Living". For who can walk out to an orderly apiary on a lovely fall day and deny the beauty of his surroundings?

The sky-office building is not for you. Nor are the dust and dirt and grime showered down on the city by the pointing fingers of a city's smoke stacks. You can turn your back on the noise and push of a thousand different traffic jams, leave behind the jostling of crowded streets and stuffy elevators, ignore the frowning face of the city fellow as he strives to inch his way into that tiny niche he calls "my own".

Ah, no, that is not your lot. Thanks be for that. Your lunch is eaten under the shade of the elm tree or in the sunlit kitchen of your home instead of the lunch counters of the city. Your duties take you out into the open air, not into a cramped and creepy office room. The dirt you scour from your hands at eventide is the clean fresh dirt of the out-of-doors, not the city grime that clings to the clothes and skin of a city dweller.

When the day is bright, you can rejoice at being out in it; when it rains, you can take temporary shelter. But the city lad must reject a nice day for his indoor occupation, and often finds he is forced out into the rainy days by the need to catch a bus or heed a factory whistle.

You can be your own master, working harder at those times when nature seems to drive you on, slacking up when the day calls for a spot of laziness now and then. No time clock, no boss, no "do this, do that, do this, do that" for you. How hard you work is a matter of your own conscience.

You can find practical inspiration from the industry of the bees you work with, from them learn lessons of civilized community life. You can watch Mother Nature play the forces she commands one against the other until an ordered balance emerges as victor. A city man has only the imperfections of other city men to observe and to copy; your example is Mother Nature herself.

Particularly in the fall is the beekeeper a lucky man. Those sticky summer days have been wiped out by breezier ones, when the autumn air touches you with the softness and coolness of a length of silk. The air becomes more transparent and clear, as if you had suddenly washed the windows of your eyes. Colors are flamboyant, gay, even wild with that strange exhilaration that comes to nature before the dead and calm of winter beset it. Days start out with the blushing promise of a subtle sunrise, burst into full brilliant bloom at noon, then dwindle away to the long dancing shadows of twilight.

These days are perfect days. And you, lucky man, are a part of them. Not a segregated observer secreted away in a tiny office, but an **integral part** of the best that the universe has to offer.

Job Inventory for Technical Apiculturists.—Mr. Henry Schaefer, president of the American Beekeeping Federation, recently instituted an Educational Research Committee and asked me to act as chairman. This committee will deal with problems of extension, research and teaching and their relationship to the industry.

A few men are being trained each year for technical jobs relating to beekeeping. This is a big country and the right man and the right job do not always get together—sometimes not at all and sometimes not very quickly.

As one of it's functions this committee will keep an inventory of students or other technical personnel requiring jobs. The committee will assume responsibility to neither the employer nor the employee but will attempt to perform this service in the interest of both parties and the beekeeping industry.

Any person wishing to take advantage of this service should send their name along with personal statistics, training and particular qualifications to the undersigned.—E. C. Martin, Department of Entomology, Michigan State College, East Lansing, Michigan.

From the Field of Experience

Some Honey at Last

by WILLIAM H. FREEMAN, Kalmia, North Carolina

Some full shallow combs from my honey crop.

APPROXIMATELY seven years ago, I decided that I wanted a few colonies of bees. I had had quite a bit of experience cutting bee trees and putting in swarms that were in old box hives and log gums. Actually, at one time I didn't know what a real bee hive was.

My father had kept a few stands off and on as long as I can remember —although we never had any honey unless we got it when we cut a bee tree. In fact, we located and cut 18 trees in one season.

My neighbor had six stands of bees — three box hives and three so-called, patent hives, which I bought for $40.00. The patent hives were single stories, didn't even have shallow supers and the box hives had been robbed heavily. So, about all I had was boxes and bees and this was September, but I was really delighted with my bees anyway.

I lifted the top super off of the heaviest one just at dusk one evening to see how they were getting along. The only thing I learned was to leave the lid on.

I had borrowed a veil which I was lucky enough to have on, and a pair of old work gloves. My wife counted 60 stings in one glove after I had quit running and got back to the house, for I had lost myself in a patch of mountain laurel. All of the stings were not in the gloves—there were plenty in my skin, but I learned to take stings pretty well.

I knew that the bees must be wintered and I didn't even know how to make syrup. About this time I had started bee hunting and met a man that had some modern beekeeping experience. He told me a few things off hand and said I should get in touch with Mr. W. A. Stephen, Extension Apiarist at Raleigh, North Carolina, if I was going to try beekeeping. Mr. Stephen sent me a little book titled "Bee Lines".

One stand came up with Nosema. The bees had it real bad so I moved them about 20 miles away to where my father lives, south of the Blue Ridge.

There is a lot of poplar at this place. The bees were strong but it seemed to keep an awful lot of them busy doctoring the sick ones. When the poplar started blooming, I gave them a food chamber with foundation. Then a little later, I gave them a shallow super.

THIS SEASON I moved eight more down to my father's place making a total of nine. I fed them plenty of sugar syrup and they built up very fast. The poplar escaped frost and I got approximately four shallow supers of good honey which I was well pleased with. I also got four mixed which was so bitter it is only fit for bee feed which I am sure will come in handy later on. The old timers say that its persimmon and its bitter enough to be.

I soon found out that beekeeping 20 miles away requires a lot of extra time.

Tips on Seasonal Colony Management

by A. D. MADDRY, Abbeville, La.

BEES IN THE HIVE! Plenty of bees in the hive! That is the basic fact upon which all other beekeeping science rests. No matter how favorable everything else may be, the heavy loads to the extractor depend upon whether there are plenty of bees in the hive.

If that is the foundation upon which our house rests, then all useful beekeeping knowledge is related to it. It seems to me that several other very important facts stem out from this base. Bees in the hive at the right time is one of them. Bees with the right morale is another. A third is, bees of s u p e r i o r quality. Possibly someone will stand and show me where I am missing something but as I now see it, with plenty of good quality bees of high morale at the right time, I expect to get honey if there is any.

If my reasoning is correct thus far, then all effort should aim at this one objective. Of course, there are many other things to consider but there is no profit in bothering with them if we miss this main objective. I wish to discuss two phases of how to attain this goal in the deep South where bees fly all of the year and where the honey flow begins about February 25th and ends around November 15th. (By deep South I mean that region where we give the school children a holiday when it snows and most children graduate from high school without having more than one such holiday.)

One important factor can be accepted as applicable everywhere, that is, a fresh, strong queen of the right blood lines is absolutely n e c e s s a r y. No manipulation can overcome a poor queen.

Assuming that we have such a queen let's start out for the spring crop. It is January and remember that, down here, bees gather some pollen every month in the year. The queen starts laying early in January and, about February 25th, willow starts blooming with plenty of pollen and a fairly sharp flow. Right on the heels of willow comes blackberry, also a fair build-up producer. As soon as the willow flow starts the queen begins to throw eggs at everything that has a bottom and by March 15th the hive is boiling with bees and the major portion of them are still in the housekeeping age. Three weeks away the main flow begins or fuses into the willow and blackberry.

The q u e s t i o n now before us is whether we shall super, Demaree, destroy queen cells or reduce the population in the overflowing boxes. I tried supering and Demareeing and cell destruction and for my trouble I got swarms or the "sulks". (I never want to see another sulky colony). I have discarded those plans for population control. They may work fine on fast, short flows but they don't work for me.

About the middle of March I work every colony closely. If I find weak colonies I give them several combs of sealed brood from a crowded colony. This makes both colonies safe. (Mark the weak ones and watch to see if the trouble is a weak queen). I then take new hives and place four combs of sealed brood and one comb of eggs in the hive and put in one frame of honey and fill out with combs. An overcrowded colony is moved, undisturbed, to a new location and the new colony is set in its place. This hive will get the field bees from the strong colony which seems to think that it has swarmed.

Two weeks later a new queen is out in the new colony and extra cells have been destroyed. I then place about six frames of sealed brood in the hive and they are ready to do business. In a yard of 40 colonies, five or six new colonies built up this way will control swarming and when the honey is taken off I can't see the difference in their production and the old colonies.

THIS CALLS for moderate increase but I doubt if any deep-South beekeeper can keep his colony count static unless he lets his bees go to the woods and when this happens the population is not controlled, but is lost.

When bees are handled this way in spring the idea is to keep the population just under swarming and a careful watchfulness is necessary throughout April. To take care of this I usually have several "nucs" on hand with

young, mated queens. When I find swarming signs I remove several frames of sealed brood and replace with empties. This brood goes to the "nucs" and the broken hatching continuity in the crowded box usually takes care of the swarming idea. If possible it is best to anticipate the completed queen-cell stage or more drastic depopulation may be necessary which fails of meeting our basic objective—plenty of bees in the box, for now is the time they are needed.

The "nuc" idea is simply a "pop valve" arrangement but they sometimes produce some surplus.

The fall flow is another matter. Between spring and fall flows we have almost 60 days of nothing. Since the honey comes off at the end of the spring flow the bees must get a fall flow or go into winter facing starvation. Regardless of stores they dwindle to the danger point.

The problem now is to have bees ready when the fall flow begins—usually the second week in September. If allowed to go into the fall flow naturally they often start the flow underpopulated and use what honey they get to build up. That puts bees in the box but at the wrong time.

Requeen Early

To guard against this I try to requeen between June 1 and July 15. New queens will push a colony along whether there is a flow or not. Since the demands on a queen in the deep South are probably three times what they are in the North, queens should be changed yearly anyway. The fall laying doesn't seem to hurt a queen like the spring laying so their performance the following spring is unimpaired.

If I later find colonies that are dwindling too much I feed light syrup. If pollen gets too low I make a sort of batter of pollen substitute and very heavy syrup. Both of these moves are made in late July or early August and starts brood rearing.

In my own case I am interested only in winter stores from the fall flowers so I simply try to build up enough so that there are sufficient house workers and a fair field force to start working the smartweed flow the first week in September. Our flow usually lasts until the first or second week in November. The smartweed booms brood rearing which matures in time to work the goldenrod and aster. Most of the time the young queen will take care of this.

One final word on winter. Sooner or later a man gets caught with stores too low. Here, the northern boys would say, "Feed in the fall". I tried it and the little stinkers raised brood on it. Remember, I am in the deep South and I have often slept during December nights with only a sheet over me. Don't feed down here in the fall. Wait until they are scraping the bottom of the barrel in January or February and then go in late in the day and pour heavy syrup over the combs. To do this I get a tomato can and puncture the bottom (or perforate). Fill this with syrup and swing it over the empty comb held flat. Getting to it is no problem for the bees here so I put it in anywhere.

Wherever we are we probably have some conditions that are peculiar to our own yards. These we must meet personally and the other fellows book won't help us. After all, beekeeping is common sense and judgment plus a knowledge of basic facts. The basic facts apply to all sections and we must rely on our own judgment to adjust them to our own peculiar needs.

One thing we must learn or fail—have plenty of bees in the hive at the right time.

Beekeeping in Cyprus

by GEORGE P. GEORGHIOU

ALTHOUGH CYPRUS has about 20,000 colonies of bees, less than 2,000 are in movable-frame hives, the remainder are in clay barrels. My main effort in working with beekeepers in Cyprus will be directed at getting them to transfer as many of their colonies as possible to movable-frame hives. Until this is done it will be impossible to bring about good control of bee diseases.

This year is the first time that Nosema disease has been reported on Cyprus. To date we are still free from American Foulbrood and European Foulbrood and Acarapis Woodi as well.

Our honey production has been very low this year, almost 25 per cent of average. It means there will be very little of the famous thyme honey to be had anywhere.

Controlling Mice Damage in Stored Combs

by DR. E. J. DYCE, Cornell University, Ithaca, N. Y.

MICE CAUSE much damage to stored combs as well as colonies during winter. Every effort should be made to exterminate both mice and rats from the apiary and honey-house. Efficient baits may be purchased locally or in large quantities from the Division of Predator and Rodent Control—Region 5, Fish and Wild Life Service, U. S. Department of the Interior, 643 Park Square Building, Boston 16, Massachusetts.

One of the best home-made mouse poison formulae is prepared as follows:

Mix 1 level tablespoonful of laundry starch in ¼ teacup of cold water. Stir this into ¾ of a pint of boiling water to make a clear paste. Mix 1 ounce of strychnine sulphate (not strychnine alkaloid) with 1 ounce of baking soda and stir this into the hot starch paste to make a smooth creamy mass free from lumps. Then stir in ¼ pint of heavy corn syrup and 1 tablespoonful of glycerine or liquid petrolatum. Honey may be used to replace the glycerine or petrolatum.

When this has been well mixed, pour it over 12 pounds of wheat and mix thoroughly to coat evenly each grain. Rolled oats are considered to be more attractive than wheat to mice but a number of persons have reported difficulty in getting an even mixture with it. If rolled oats are used, add the above amounts of poison and other ingredients to eight quarts of rolled oats from which the fine particles have been screened and then mix very thoroughly with a putty knife or a hand chopper until all lumps are broken up and the mixture is of a fairly even texture.

While this formula, on first reading, might appear complicated, it is actually easy to prepare. The liquid and powder ingredients are mixed in a small container and poured over the grain and thoroughly stirred into it until each grain takes on a glassy appearance. The treated grain is then placed in a warm dry location, such as above the furnace, and stirred each day for two or three days, or until it becomes thoroughly dry. If whole wheat or oats are used, the grains do not cling together when dry. The thin coat of poison covering each grain is barely noticeable. The poisoned grain may be distributed with a tablespoon and stored for several months in a closed container. The usual precautions in handling poison should be carefully observed.

No More Wax Fires

by WAYNE KELLER, Oshkosh, Nebraska

PUTTING WAX above a fire has come to seem to me to be one of the most fool-hardy things anyone might do. A kettle or boiler of the treacherous stuff forgotten for one moment can cause loss of honey-house or home and even life.

Many beekeepers, like myself, develop their talent and business with a small cash outlay without the conveniences some have, and learn better ways only out of necessity. I needed a way of preparing my capping wax day by day as it was collected, rather than remelting all on an idle day in winter.

The advantages are: a longer period from which to select a desirable market, less bulk about the honey house, convenient use of waste steam, few wax molds or pans. In connection with the steam idea, I remember a relative cooking tons of cheap potatoes for livestock. He had a large barrel which he tried to heat with an open fire outdoors. He could much easier have used a pressure cooker with a jet of steam released to do the cooking. The average person does not realize the heating potential of a jet of live steam, though some distance from the fire.

At the risk of angering the housewives, I want to make a suggestion. Mr. Beekeeper, when your business is as profitable as your wife's pressure canning, convince her she is losing money not helping you instead, then take her old pressure canner out to the honey-house and set it on a tiny stove there. It will do a good job.

My set up is as follows: A rubber hose is stuck on a small pipe screwed in where the old steam-release-petcock was. This hose leads steam to the uncapping knife and through numerous

(Continued on page 629)

Live and Learn

By Propolis Pete

IF THERE ARE any of you dear readers who follow this page more or less regularly, you will know that I have always had a lot of trouble trying to get comb honey. But this year is different. So, if you want to learn how to produce comb honey, gather around the old maestro and unbutton your ears. First of all though, maybe it would be best if you read back in the August GLEANINGS, in order to get the complete picture.

All of the above adds up to the fact that I had three comb honey supers ready for the flow, and that I got 66 extra fine sections out of the three. The rest were culls, in the sense that they were well filled, but the combs were either bulgy or irregular because I made a sloppy job of the foundation. Not intentionally of course, just due to inexperience.

Want to know how I did it? Well, here's how.

First of all, you should get and read every bit of literature on the subject that is available to you. Then take it up into the attic, put it in the trunk behind the chimney, and lose the key. The reason for this is that sometimes in the course of the season you are going to see something that you recognize. The big trick then is to do just the opposite of what you remember you should do. The reason that I made this marvelous d i s c o v e r y is that I haven't got enough equipment for the colonies that I have. I got caught short with some powerhouse colonies that needed more room, and I didn't have any more supers to give them.

Towards the end of May I had some colonies that were getting sort of crowded. It wasn't time yet for the main flow. This was before I knew that the bees were not going to swarm this year. But those colonies just simply had to have more room, so I slapped on the three comb supers where they would do the most good, and not where I was expecting to get sections.

Well sir, those crazy bees went right up into them, drew out the foundation and filled it with honey. When I took them off in August they were heavy. Since I knew that some of the foundation had slipped, and some had fallen down, and experience told me that bees here wouldn't make good sections, I was expecting a mess. So I extracted all the regular frames of honey, bottled what I needed immediately and ran the rest into five gallon cans.

THEN I TACKLED the comb supers. I wasn't even careful. I turned the supers upside down, and pounded out the section boxes with a mallet. When I pried apart the section holders and separators I couldn't believe my eyes. This was the super containing the four and one-quarter inch square boxes and of the 28, 24 were as nearly perfect as anybody could expect. This super did not have any frames at all as bait. The other two supers had 4 x 5 sections, with a shallow frame on the outside as bait. The sections here too were well filled out, but there wasn't quite the same finish that there was on the first one.

I don't know whether or not this means that the bees like the four and one-quarter inch better, or whether it was just the nature of that particular colony to turn out better work. It could have been the location of the super, but darned if I can remember whether this one was the one on top of three deep bodies, or the one on top of two deep bodies, or the one that I had between the two brood bodies.

Anyway, I got 66 extremely fine sections of comb honey. The bees had propolized the wood considerably, which didn't look nice, and there was some, but not much, travel stain. Regardless, it didn't stop a lot of people from running in as soon as they got the glad news and paying me 75c a section for it. Not only that, but when they tasted it, they came back and bought four or five more just to have it on hand.

Don't feel too badly about that, fellers. If everybody around here had so much comb honey that they would have to wear badges to keep from trying to sell it to each other, maybe we would only get 35 or 40 cents too. And also, don't forget that I have a waiting list every year for extracted honey—people who know that local

(Continued on page 636)

A Talk to Beekeepers

Recent Trends in our Industry

M. J. Deyell

The Hutzelman Solution

THIS WAS AN alcohol-formalin solution developed by Dr. J. Hutzelman, for sterilizing combs infected with American foulbrood.

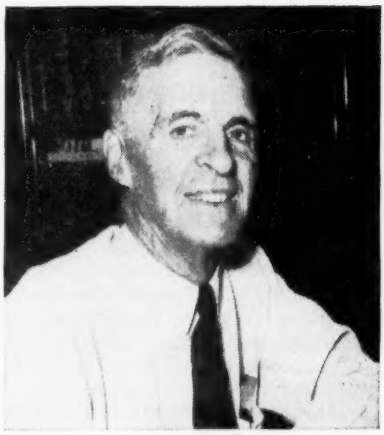
An article appeared in the November 1923 issue of Gleanings, by the late George S. Demuth, entitled, "American Foulbrood Ousted". A beekeeper in northeastern Ohio treated 6,000 diseased combs. At that time, we had a considerable amount of AFB in Medina County and we tried to save some diseased combs. I can recall a rather disagreeable job of treating these combs during the late fall in a small building. Part of the work consisted of removing the treated combs from the solution, putting them in a 4-frame hand extractor in order to whirl them as dry as possible. It was a disagreeable job because the strong odor of the solution was unpleasant, in fact, it made my eyes water.

It was found later, as a result of some work done by the Bee Culture Laboratory, at Washington, that there was a too high percentage of recurrence of AFB from the treated combs to warrant the use of the Hutzelman solution.

Killing Colonies in the Fall and Installing Packages the Next Spring

This idea of killing off bees in the fall was put into practice by a few beekeepers about 30 years ago. It is still practiced by some in the northern states, also in Canada. In the far North it may be an advantage to kill the bees late in the fall, starting with packages the following spring. However, some are finding it is entirely possible to winter bees out-of-doors, and experiments conducted show that wintered-over colonies are likely to store more surplus than those developed from packages installed in the spring.

About 25 years ago, I recall visiting a commercial beekeeper in Ohio who had decided to kill off his bees in the fall. At the time I visited him, he rather hesitatingly mentioned the mistake he made. He had removed the



Jack Deyell

queens with the idea of permitting all of the brood to develop and emerge before destroying the bees with Cyanogas. However, he had forgotten to destroy all queen cells on the 9th day after removing the queens, consequently most of the colonies had produced young laying queens. He was learning the hard way.

Even though killing bees in the fall and installing packages the following spring involves considerable labor and expense, this practice should result in colonies uniform in strength and with young queens.

On the other hand, the beekeeper in the North who winters his bees has to worry about each colony being well fed and protected against the elements. If the weather is favorable for outdoor wintering, he then has his bees in the spring, ready for early manipulation.

Disease Resistant Bees

ABOUT 20 YEARS ago, the idea of producing strains of bees with a high degree of resistance to AFB was born. It seems probable that this had been thought of prior to that time but very little, if any, experimental scientific work had been done along this line. However a considerable amount of such work has been done along this line during the past two decades.

Even though a strain of bees 100 per cent resistant, or immune to AFB,

should be developed, which at the present time seems somewhat doubtful, there would still remain the problem of keeping this strain pure or unmixed with less resistant strains, as well as combating disease that now exists. Strains of bees possessing a high degree of resistance to brood and adult bee diseases are desirable.

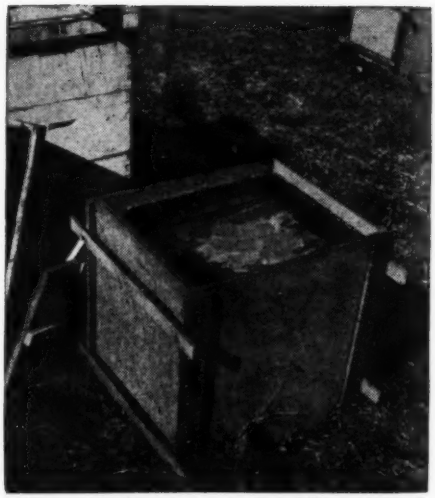
Hive Heaters

Various types of hive heaters have come on the market, some of which have apparently served a useful purpose. It would appear that hive heaters might be used in some sections of the South where queen breeders have cold spells of weather during the spring. These heaters could be installed in cell-building colonies and perhaps in queen-mating nuclei, to prevent the loss of queen cells during cold weather in early spring. However, if cells are saved and the virgin queens permitted to emerge, by reason of using hive heaters, and if the cold weather continues, preventing virgin queens from going out on their mating flights, the queen breeder is still at a disadvantage. We cannot yet control the weather.

Regarding the use of hive heaters in the production of strong colonies ready for the main honey flow, it is possible there may be some advantages, especially in some sections of the country. However, if cool weather prevented the bees from gathering natural pollen, it would be necessary to feed either a pollen substitute or a pollen supplement. Furthermore, the cost of purchasing and installing hive heaters would have to be taken into account. If enough extra surplus honey is produced with the use of heaters to more than pay for the expense involved in maintaining heaters, all well and good. At present the general consensus seems to be that the use of hive heaters is of doubtful value.

Pollen Supplements and Substitutes

The use of pollen substitutes is not exactly new. The late A. I. Root used them on a limited scale 80 years ago. The use of pollen supplements came into use only recently. This has reference to collecting pollen at hive entrances by means of pollen traps and mixing it with soybean flour, to be fed to the bees at a season of the year when pollen is not available, or is very scarce. Without a doubt, the use of substitutes such as soybean flour mixed with dry skim milk or animal yeast has a place, especially in sections where pollen sources are not plentiful. Bees do require pollen or a substitute for brood rearing.



Pollen substitute covered with waxed paper has been placed on the colony shown above.

Carbolic Acid for Removing Surplus Honey

THE BEE ESCAPE has been used for quite a number of years in removing supers of honey ready to come off. This necessitates making a trip to the outyards in order to place the bee escape board underneath the supers to come off, then another trip to pick up the honey.

Some years ago the carbolic method was devised by Charles Mraz of Middlebury, Vermont, and is being used by a number of beekeepers at the present time. This necessitates the use of what are called carbolic pads, pieces of burlap fitted into a telescope cover with a rim at the edges of the cover inside. Ordinarily five or six of these rims are used in a yard of 40 or 50 hives. Carbolic acid with 10 per cent water added is sprinkled on the pads with a cloth sprinkler then these pads are placed on the top of the pile of supers to come off. In a relatively short time the bees are driven down into the brood chamber, that is, if the weather is sufficiently warm for the

Charles Mraz, originator of the carbolic system, displays here some carbolic pads. The pads are still good after years of use. Interested readers should refer to the July issue of Gleanings for more details.

carbolic acid to work well. The honey is then taken off the hives and carried to the truck. This does simplify removing surplus honey.

Some buyers of honey object to purchasing honey that has been removed with carbolic acid because they claim that the honey may be tainted with the acid. We do not condemn the carbolic-acid method but we do say extreme care must be used in applying this method. Be careful to avoid having the liquid come in contact with the combs of honey. For further information turn to page 404 of July, 1954, issue of Gleanings for an article by Chas. Mraz of Middlebury, Vermont.

Processing and Handling Honey

Some progress has been made in recent years in extracting, processing, and handling honey. There is still much to be done along this line.

As I get over the country, visiting honey extracting houses here and there, I find a variety of methods of handling supers of honey from the time they leave the truck after being brought into the apiary, until the honey is extracted. There is also a variety of methods of handling cappings, straining and processing honey.

It is difficult to standardize a method that incorporates all of the best features of the various methods that are being used, because each beekeeper seems to think that his method is the best. However, as time goes on there is bound to be one best method incorporating the best in various methods used and this should be standardized, using efficient equipment that is not beyond the reach of the average beekeeper.

A simple and efficient method should be worked out for the small beekeeper who processes his own honey and sells it locally. Some progress is being made but more work needs to be done along this line.

In this and the previous talk I have departed from my usual custom of dealing with problems related to seasonal apiary management and have tried to point out a few developments that have occurred recently in our industry.

Next month I plan to begin a series covering a three-weeks trip made through seven eastern states in August. The contacts I made and experiences I had were so thrilling that I just have to share them with our readers. My camera was kept busy enroute, so some of you will be seeing your pictures.

B de Z Library

Asked & Answered

Origin of Brood Diseases

Question: An old bee-man here says that whenever we open hives at a time that would chill the brood, this results in foulbrood. Is he correct in this?—Florida.

Answer: No. Neither American foulbrood nor European foulbrood could possibly be caused by chilled brood. The cause of each of the brood diseases has been definitely established. American foulbrood is caused by a micro-organism known as **Bacillus larvae,** and European foulbrood is caused by another micro-organism known as **Bacillus pluton.** There can be no American foulbrood unless some of the organisms causing it are carried into the hive from a diseased colony. The same is true of European foulbrood. A simple experiment will show that chilled brood does not cause the brood diseases. By placing a comb of chilled brood in a healthy colony the bees will clean out the dead material and no harm done; but if a comb of American foulbrood is placed in the hive, the disease spreads until the colony is destroyed unless the beekeeper intervenes to save it.

Wintering a Late Swarm

Question: Do you think that a swarm of bees which was hived the last week in August could store enough honey to carry them through the winter?—New York.

Answer: This depends upon whether there was enough nectar available in September and early October. If there was an abundance of nectar-bearing fall flowers in your locality, the colony has no doubt stored a sufficient amount for winter. If it did not store enough, this can be corrected even this late by feeding sugar syrup made of two parts of sugar to one part of water either by weight or by measure. In feeding so late in the season the feeder should be placed directly over the frames against the cluster and should be covered with planer shavings or other packing material in order to conserve the heat of the colony and prevent the syrup from getting too cold. A more important question is whether the colony was able to rear enough young bees during September and early October to make a good colony for winter. This also depends upon whether there was enough nectar available to keep up brood-rearing. If not, this could have been corrected by giving combs of honey or feeding sugar syrup to provide an abundance of food during September, but it is now too late to stimulate brood-rearing in this way. If the colony is too small to winter well as it is, it can be united with another small colony or two colonies can be put into one hive with a tight division-board between.

Feeding Corn Syrup for Winter

Question: Would it be safe to feed corn syrup (Karo) for the bees to winter on?—Kansas.

Answer: Corn syrup would not be fit for winter food for the bees even if you could induce them to take it, which is doubtful. Even a small amount of this syrup mixed with sugar syrup would be fatal to the colonies in the North where the bees cannot have frequent flights. Sugar syrup made from granulated sugar and water is the only safe substitute for honey.

Killing Colonies in the Fall

Question: I have more colonies than I can keep here with profit, and there is no sale for them. I want to kill about 30 colonies. What is the quickest and cheapest way to do this without injuring honey for feeding purposes?—Wisconsin.

Answer: No, don't do it. It would be much better to carry the bees to an out yard and unite them. If you unite in the home yard the old bees will go back. In the uniting be careful to pick out the combs containing the most honey and pollen and of course all brood if any. If you must kill the bees use calcium cyanide. To apply, put a tablespoonful on a sheet of paper and shove into the entrance. The gas will rise and kill the bees in the space of a couple of minutes. The cyanide is sold under the commercial name Cyanogas. It can be purchased in pound cans at the drug store or a seed house. In applying be careful not to breath the fumes of the gas. They are deadly poison.

Insufficient Stores Left After Extracting

Question: If a colony fills three extracting supers and I take them all off, will it be necessary to feed this colony sugar syrup for winter?—California.

Answer: If there is no later honey

flow to supply stores for winter, it will be necessary either to feed such colonies for winter or to give them a food chamber of honey. Often it is not safe to extract all the honey from the supers even when a later honey flow is assured, for there may not be enough honey left in the brood-chamber to enable the colonies to keep up brood-rearing until the later honey flow begins. Such close extracting no doubt puts more colonies of bees out of commission for the next season, every year, in this country than all the brood diseases combined. If all the beekeepers in the United States could in some way be induced to leave 50 to 60 pounds of honey in double brood-chambers at the close of the season for the bees, the total honey crop of the country the next season would no doubt be more than doubled. The successful beekeepers are those who supply their bees with an abundance of stores at the close of the season or who are located so favorably that nature supplies sufficient food for the bees after the honey has been extracted.

A Good Use for Dark Honey

Question: I have six or eight supers of very dark honey (probably honeydew honey). I have no extractor, and it seems too bad to waste all the comb to remove the honey. What can I do with the honey?—Kentucky.

Answer: Put one of these supers of dark honey on each of your colonies in the spring so that the bees can use it for brood rearing. By giving them an abundance of honey in this way they should build up to greater strength than when this is not done. By doing this, you can have the dark honey converted into bees, which should increase your crop of light honey next summer.

To Delay Granulation of Bulk Comb Honey

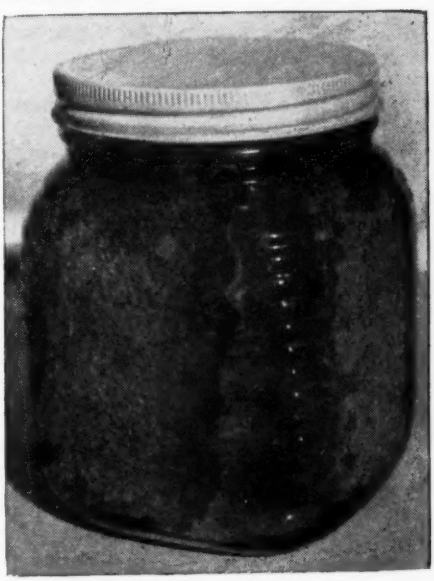
by H. H. ROOT, Associate Editor

MR. GEORGE REHMAN, North Baltimore, Ohio, has a beautiful pack of bulk comb honey in which he has taken great pains to prevent granulation.

If one is careless in placing the undrained cut comb in the jar, the honey disturbed by the knife and clinging to the cells, will subsequently drain off and account for one-half to one inch of liquid honey in the bottom of the jar. This, never having been heated, and also because it is disturbed, will granulate very quickly. Mr. Rehman dries his cut pieces thoroughly until they are virtually non-dripping, then places them in the jars.

The honey that is poured over the comb is heated to 160 degrees and then cooled to 120. This heat does not melt the cappings but as soon as the lids are on, the jars are overturned and left alone, separated so that the honey cools rapidly. Later on, when turned right side up, the pieces of comb slowly rise to the top.

By allowing the cut honey to drain away from the pieces, granulation is greatly delayed. However, bulk comb honey is a pack that should be marketed and sold as quickly as possible. Granulation does not impair the taste but it does affect the looks of the pack. It goes without saying that only the most perfect pieces of honey with the whitest cappings should be packed in bulk.



Mr. Rehman's beautiful pack of cut comb honey.

Just News

Honey Export Program Terminated. —The U. S. Department of Agriculture announced the termination of the honey export program, effective 11:59 p.m., August 30, 1954. To be eligible for approval, applications must have been received by the appropriate U. S. Department of Agriculture office or postmarked not later than 11:59 p.m., August 30, 1954. This termination does not affect honey for which an application has been approved.

Applications approved under the program since its inception, July 21, 1954, totaled approximately 27 million pounds.

The annual convention of the **Wisconsin Beekeepers' Association** will be held Thursday and Friday, October 28 and 29, at the Retlaw Hotel in Fond du Lac. Further details are obtainable from Mr. Alan Vosburg, Ft. Atkinson, Wisconsin.

The state convention of the **Arkansas Beekeepers' Association** will be held October 11th, in the Legion Hut, Harrison, Ark. Registration will begin at 8 A.M with the meeting starting at 9 A.M. Prizes, prominent speakers, and a banquet will highlight the program.

The **New Jersey Beekeepers' Association** will meet October 16 at Hotel Roger Smith in New Brunswick. A banquet will be held at 6:30 P.M. A honey cookery contest and prominent speakers will highlight the affair.

The annual state meeting of the **Tennessee Beekeepers' Association** will be held October 21 and 22 at the Farragut Hotel in Knoxville. Walter Barth, Associate Editor of Gleanings, will be one of the guest speakers. There will be honey displays and prizes.

The **Connecticut Beekeepers' Association** meeting will be held October 16, 1954, a Saturday, at the Y.M.C.A. Hartford, Conn., corner of Jewel and Pearl streets, northeast of the Capitol building.

The speaker for the day will be Prof. Edwin Anderson of Pennsylvania State University, on a new type of hive used by him.

All members of the Association are urged to attend as there will be several matters of legislation to come before the meeting which need serious attention.

Out-of-state beekeepers are welcome to attend the meeting and enjoy the program and friendship of fellow beekeepers. — Philemon J. Hewitt, Jr., Chairman of Publicity.

The **Westchester County Beekeepers' Association** will hold its next meeting Sunday, Oct. 17th, at 2:30 P.M. at the Odd Fellows Hall, 20 Lockwood Ave., New Rochelle, N. Y. This will be our first indoor meeting of the year and a good program is planned. Refreshments will be served at the close of the meeting.—Carlton E. Slater, Pub.

The annual convention of the **Indiana State Beekeepers' Association** will be held at the Hotel Washington in Indianapolis on October 23. It will be a one-day meeting with noon luncheon. An interesting program featuring worthwhile speakers is being planned. —Gilbert Perigo, Sec.

The next meeting of the **Middlesex County Beekeepers' Association (Mass.)** is scheduled for Saturday, October 30, at which time we will have our annual banquet to open the fall and winter indoor programs. Mr. R. W. Corrigan of Reading, who did such an excellent job last year, has again been selected to be in charge of making arrangements. More information regarding the banquet will be given members soon.

The final outdoor meeting of the season was held on Saturday, September 25, at the farm and apiaries of Mr. and Mrs. Charles Helmboldt in Westford, Mass., and a large number gathered to enjoy the Helmboldt hospitality. At this meeting, the Club Hive, consisting of one deep body and two supers, was raffled off, as well as a

variety of other prizes which had been donated to the Association by some of the members.—L. C. Proctor, Sec.

The **Ladies' Auxiliary** of the **Wisconsin State Beekeepers' Association** will hold its annual meeting together with the State Association at the Retlaw Hotel, Fond du Lac, on October 28th and 29th. A fine program has been arranged, together with honey baking, honey candies, and hobby shows contests, with fine prizes for all entries.—Mrs. Art. Schultz, Pres.

The **Georgia State Beekeepers' Association** will meet Monday and Tuesday, November 29 and 30th at Valdosta. Valdosta is on route 41 and is directly north of Orlando, Florida, where the Southern States Beekeeping meeting will be held December 1, 2, and 3. Why not plan to attend all of these meetings?

The **Berks County Beekeepers' Association** will hold its fall meeting on Thursday, October 14, at 8:00 P.M. in the new nurses home at the Wernersville State Hospital, Wernersville, Pa. Mr. W. C. Clark, Extension Bee Specialist of the Pennsylvania State University will speak. The film "Bees for Hire", will also be shown.—Samuel B. Althouse, Sec.-Treas.

Southern States Beekeepers' Federation Orlando, Florida, Dec. 1 and 2, 1954

The 26th meeting of the Southern States Beekeepers' Federation will converge at the Orange Court Hotel in Orlando in early December. A most interesting program is rapidly shaping up and will appear in complete form in the November issue.

Featured among the important papers to be presented is one by Prof. F. E. Guyton of Alabama Polytechnic Institute giving results of several years research on bee stings in treating arthritis and neuritis.

Dr. Ouida Abbott of the University of Florida will give the results of her investigations of the use of royal jelly in human nutrition.

A mammoth honey show and auction of the many types of southern honey is in the making.

Fortunately the large plant of the Florida Honey Cooperative is near Orlando and those attending the coming meeting are to be treated to an interesting and instructive tour of the plant. In addition, considerable time at the convention is to be devoted to the operation and workings of this unique co-op.

Bulk comb honey, one of the distinctive products of southern beekeeping is to be up for discussion. A panel covering prices, marketing problems and other angles is expected to bring out most of the producers of this pack.

Last year in Atlanta the Southern States Beekeepers' Federation celebrated its 25th anniversary. At the coming meeting the pioneer southern beekeepers who through the years largely put southern beekeeping on the map are to be saluted and feted.

Don't forget, December is a delightful time in Florida and Florida people really know how to show you a good time. So take a few days off, enjoy an interesting meeting and treat yourself and the family to a fascinating experience. On to Orlando, December 1st and 2nd.—David Dunavan, Clemson, S. C. Chairman, Program Committee.

The annual meeting of the **Kansas State Beekeepers' Association** for 1954 will be held in Kansas City, Kansas, on Saturday, October 17th.

NO MORE WAX FIRES

(Continued from page 621)

feet of copper coil for melting the cappings. But that steam isn't dead yet! Did you know that the outlet will still boil 15 or 20 gallons of wax? Add no water, for the condensation of the steam in raising the wax to boiling would make too large a volume to get the wax hot enough to strain well.

My plan is to remelt the cake of wax collected from the previous day's cappings. This takes several hours while I am doing my usual uncapping and extracting. For very rapid melting, one may bypass the uncapping knife and capping melter coil, that is, when one has a large batch of comb or a late start.

It is a good plan to jacket the melting tank with asbestos, or even cardboard. My boiler on the stove occupies

(Continued on page 637)

A Beekeeping Vacation

by JAMES B. BREWER, Berlin, Wisconsin

AS A THREE-COLONY hobbyist, employed during two weeks vacation by a producer of extracted honey, I marveled at the one or two acre "forests primeval" bee yard locations in good agricultural areas in Wisconsin. It seemed astonishing that bees stored satisfactory surplus where each honey gatherer must fly upward 30 or 40 feet to rise above towering oaks each time it left or returned to the bee yard. These satisfactory locations are shaded by tall trees except near noon. This is only one of many proven good methods which seem at variance with book-learned advice.

Acid boards had been tried and rejected. When I inquired about the use of acid boards on top of stacked supers on the truck to prevent bees from robbing, Joe Mills who directs the operation of Schultz Honey Farms at Ripon, said that they had been tried but that they did not prevent robbing.

The only mechanical lifting device used was an elevating conveyor, obtained the next to the last day of my stay there, for loading cartons of honey into semi-trailers. I agreed that lifting and stacking 60-pound honey cans and hive bodies full of honey, which weigh more, is normal and healthy exercise for the young and middle-aged men such as are employed there. Lifting devices would be uneconomical and a nuisance in this system of extracted-honey production.

The men who do the uncapping are so skilled that there is no need for a mechanical uncapper.

This vacation served its purposes which were: Learning how extracted production practice differs from theory; taking my thoughts almost completely away from steelworking which is my steady employment, and giving me an exceptionally enjoyable experience. Those are fortunate people who spend the whole year in an occupation which seems like a picnic.

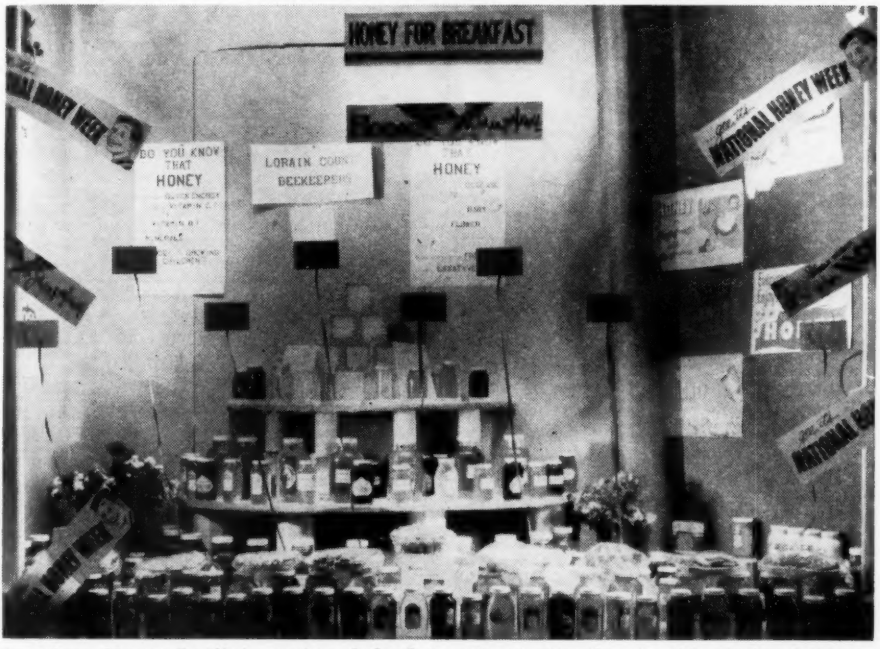
Killion Sweeps National Honey Show

GENE KILLION, noted comb honey producer from Paris, Illinois, won four of the major honey trophies offered at the second National Honey Show held August 26th through September 6th at the Minnesota State Fair in St. Paul. The trophies shown, were awarded for comb honey, chunk honey, beeswax, and for the best exhibit shown.

Dr. Mykola H. Haydak of the University of Minnesota and E. C. Martin of Michigan State College were judges for the show. C. D. Floyd, Minnesota State Apiarist, planned and directed the affair.

How a County Association Promoted National Honey Week in 1953

by HARRY VANDENBERG, La Grange, Ohio



American Honey Institute posters helped to attract attention to this National Honey Week display.

MEMBERS of the Lorain County Beekeepers' Association, realizing that in unity there is strength, voted to cooperate on one big display of honey to mark the observance of the 1953 **National Honey Week,** rather than to attempt individual displays.

Committees were appointed to locate a store window in the heart of the business section, to prepare publicity, and to collect the honey and arrange the display.

The local merchant approached for window space was surprised at first as he felt honey had nothing to do with the dry goods business, but after hearing the story of bees and their importance as a factor in our economic picture, readily agreed to have the window empty and ready for the display on the date set.

Articles were prepared for the newspapers throughout the county. First, a general news item was run, followed later in the week by a column on the uses of honey with interesting honey recipes.

The program manager of the local radio station was approached. He agreed, as a public service feature, to permit a beekeeper to talk on bees and honey on the farm program, and to have one of the beekeepers' wives on the same program later in the week to give a talk on honey as a food and to give some recipes. He also agreed to use spot announcements during **Honey Week** which were prepared by the publicity chairman. The County Extension Agent also mentioned something about honey on his program nearly every day during **National Honey Week.**

The window display was very colorful and attractively decorated. It created much interest as it included honey in various colors from water white to dark buckwheat. Comb, chunk, and creamed honey were all displayed, all properly labeled so the public would know what each color and kind represented. A mouth-watering display of honey-baked goods; each article, with

(Continued on page 636)

Buy and Sell

Only responsible advertisers and honest advertisements will be admitted to these columns. References required from new advertisers not known to us. Rate: 15c per counted word, each insertion. Each initial, each word in names and addresses, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it), count as one word. Copy should be in by the 10th of the month preceeding publication.

HONEY FOR SALE

WE BUY AND SELL all varieties of honey. Any quantity. Write us for best prices obtainable. The Hubbard Apiaries, Onsted, Michigan.

IOWA honey, one can or truck loads. Russell D. Smalley, Beaver, Iowa.

CLOVER extracted honey in sixties. Abram Brubaker, Lancaster, Pa., Rt. 2.

Michigan's finest raspberry, basswood, clover comb honey, in 4 x 5 window cartoned sections. Extra Fancy, $8.00; Fancy, $7.00; No. 1, $6.00; No. 2, $5.00 case. E. Z. Quick Way B Farms, Boyne Falls, Mich.

MICHIGAN'S FINEST WHITE CLOVER HONEY. Thoroughly ripened. New sixties. No disease. Sample, twenty cents. You will be pleased. John McCOLL, TECUMSEH, MICHIGAN.

Light clover honey. 60's, $10.20; 10, $9.90 each. Harris Bee Supply, Jackson, Tenn.

HONEY FOR SALE. Write for prices. Lloyd E. Allen, Tipton, Mich.

HONEY AND WAX WANTED

BEEKEEPERS TAKE NOTICE—We can not guarantee honey buyers' financial responsibility, and advise all beekeepers to sell for cash only or on C.O.D. terms except where the buyer has thoroughly established his credit with the seller.

CASH for your comb honey and all types extracted. Send sample and best price. Buckeye Honey Co., 3930 No. High St., Columbus 14, Ohio.

CASH for Beeswax. Write as to quantity and we will quote price. Muench-Kreuzer Candle Co., Inc., Syracuse, N. Y.

HONEY WANTED — All grades and varieties. Highest cash prices paid. Mail samples. State quantity. HAMILTON & COMPANY, 2613 South Yates Ave., Los Angeles 22, California.

WRITE FOR shipping tags and quotations on rendered beeswax. We buy from one pound up and if you have over 25 pounds let us work it into foundation for you at a 25 per cent saving. Walter T. Kelley Co., Clarkson, Kentucky.

HONEY WANTED for cash. All grades. Good used cans for sale or trade for honey. John Tideswell, 2711 North 63 St., Omaha, Nebraska.

CASH FOR YOUR HONEY—Light extracted or comb. Regular trade send sample. W. R. Moomaw, Stone Creek, O.

WANTED — White extracted or comb honey. Send sample. Millersport Honey Co., Millersport, Ohio.

HONEY WANTED, all grades in 60's. Mail samples, advise quantity, best price. A. I. Root Company of Syracuse, 1112-14 E. Erie Blvd., Syracuse, N. Y.

WANTED — Honey. all grades. Quote prices and send sample. Write Stoller Honey Farms, Latty, Ohio.

WANTED—Light amber-clover and fall-flowers honey. Cloverdale Honey Co., Fredonia, N. Y.

BEST CASH DEAL for your honey (any grade) and beeswax. Alexander Company, 819 Reynolds Road, Toledo, Ohio.

WANTED—white and amber extracted honey, car loads or less. Write, stating best price. Honeymoon Products Co., 39 E. Henry St., River Rouge, Mich.

HONEY WANTED: The Finger Lakes Honey Producers' Cooperative, of Groton, New York, has an excellent market for all grades of honey and will accept all types and quantities on a membership basis.

WANTED—Raspberry honey in 60-pound cans, also buckwheat. Lloyd E. Allen, Tipton, Mich.

WANTED—Buckwheat honey. Eastern Food Products, 115 Division Ave., Brooklyn, N. Y.

All kinds honey wanted. Wm. March, R. D. 3, Mantua, Ohio.

WANTED: All grades of extracted honey. Send sample and price. Deer Creek Honey Farms, London, Ohio.

WAX WORKERS, 1330 Slaterville Road, ITHACA, N. Y., will render your wax, then buy it or make it into foundation for you at reasonable prices.

FOR SALE

WRITE FOR CATALOG — Quality Bee supplies at factory prices. Prompt shipment. Satisfaction guaranteed. The Hubbard Apiaries. Manufacturers of Beekeepers' Supplies and Comb Foundation. Onsted, Michigan.

QUEENBEE PAINTING OUTFITS, $1.50 postpaid. Southwick Apiaries. Waban, Massachusetts.

THE BIGGEST BEE SUPPLY Catalog published (64 pages) free for the asking. Listing many items not found in other Catalogs. No agents—buy direct and save 20%. WALTER T. KELLEY CO., CLARKSON, KENTUCKY.

FOR SALE — New heart cypress 10-frame bottom boards. K.D., 10 or more, $1.00 each; 50 or more, 90 cents each; 100 or more, 85 cents each. One nailed up sample postpaid, $1.25. Fred L. Poole, Elizabethtown, Rt. 2, Box 67, No. Car.

ELECTRO Filling Machines, users and distributors. Write Stoller Honey Farms, Latty, Ohio.

NOW AVAILABLE, Fumigil for control of Nosema disease in bees. Write for prices and circular by Abbott's Laboratories. PRAIRIE VIEW HONEY CO., 12303 12th Street, Detroit 6. Michigan.

ROSEDALE UNCAPPING PLANES; NOW DUTY FREE—Speedy uncapping—easy to handle—adjustable depth of cut. Satisfactory performance fully guaranteed for one year. Rosedale Co., 509 Rupertsland Ave., Winnipeg, Canada.

HAVE SEVERAL tractors, Allis Chalmers Combine, and numerous farm equipment. Will trade for bees or equipment within moving distance of West Texas. R. P. Scripps, Box 511, Van Horn. Texas.

WINTER CASES, 50 two-colony packing, in good condition. Ray Wilcox, Odessa, N. Y.

FOR SALE—12,700 red 53MM caps for honey jars, 2,000 gray 53MM caps for honey jars. Make us an offer. One 16 sheet cellulo honey filter with bump pump, perfect condition, one ton per hour capacity, $695.00; five 10-foot roller conveyors, almost new, $20.00 each; three 10-foot solid roller conveyors, $10.00 each; five standards, $3.00 each; one National Semi-Automatic labeler, capacity 1200 jars per hour, $295.00. Alexander Company, 819 Reynolds Road, Toledo, Ohio.

BEES AND QUEENS FOR SALE

We use all possible care in accepting advertisements but we cannot be held responsible in case disease occurs among bees sold or if dissatisfaction occurs: We suggest that prospective buyers ask for a certificate of inspection as a matter of precaution.

CAUCASIANS. 2-lb. pkg., $3.00; 3-lb. pkg., $4.00. Untested queens, $1.00 each; 100, $75.00. Lewis & Tillery Bee Co., Greenville. Ala.

TWENTY-ONE YEARS OF BREEDING. Jersey queens for bumper crops. $1.00 each. Milton Stricker, R.D. 1, Annandale, N. J.

GOLDEN ITALIAN queens, best of quality, real gentle. 1 to 25, $1.00; 25 up, 90 cents each. These queens are bred for honey production. Carolina Bee Farm, Graham, N. Carolina.

CAUCASIAN QUEENS, real honey gatherers, and very gentle. 1 to 25, $1.00; 25 to 50, 90c; 50 up, 85c each. Black River Apiaries, Currie, N. C.

FOR SALE—29 swarms double brood with 59 supers, honey, also eight-frame extractor, storage tank. Russel Stark, Saginaw, Route 6, Michigan.

HONEY WANTED
Carloads and less than carloads. Mail sample and best prices in all grades.
C. W. AEPPLER COMPANY
Oconomowoc, Wisconsin

QUALITY BRED ITALIAN QUEENS
March 10 to June 1 $1.00 each
June 1 to Nov. 1 .50 each
All queens shipped Air Mail and guarantee to please.
Walter D. Leverette Apiaries
Fort Pierce, Box 364, Florida

Italian Queens
EUGENE WALKER
Rt. 2, Box 207
Live Oak, California

GIRARDEAU APIARIES
Tifton, Georgia
Shippers of
ITALIAN
Package Bees and Queens

PACKAGE BEES & QUEENS
"Italians"
Quality Does Not Cost—It Pays
THE WILBANKS APIARIES
Claxton, Georgia

HONEY LABELS
Improved designs, embodying color, balance, simplicity, and distinction. Please send for free samples & prices.
C. W. AEPPLER COMPANY
Oconomowoc, Wisconsin

REQUEEN NOW WITH
HOLLOPETER'S ITALIAN

Queens, are reared in the mountains of the North, from stock full of vim, vigor, and vitality. Queens reared by the veteran queen breeder, J. B. Hollopeter with 44 years' experience.

— Prices —

1-9	$1.00	each
10-24	.90	"
25-49	.80	"
50-99	.75	"
100-up	.70	"

White Pine Bee Farms
Rockton, Pa.

CAUCASIANS
CARNIOLANS

Replace old or failing queens with queens of either of these races of bees for quick build-up next spring. Gentle, prolific, and safest to keep near neighbors, streets, or highways. Expect to have queens through October in Tennessee, afterwards in La Belle, Florida. Queens $1.00 each.

W. D. REAMS
Morristown R. 5 Tenn.
Phone: 219 R2

JOHN DAVIS QUEENS

We ship until November 1 and fall is the right time to requeen. Order now and be sure. $1.00 each, any number.

LITTLE'S APIARIES
Shelbyville, Box 122, Tenn.

J. E. WING & SONS
41 Years Continuous Service
Italian Package Bees
and Queens
Our Specialty
Knights Landing, Calif.

BETTER BRED QUEENS
Three Banded Italians

We wish to thank our many customers for the business they have given us this year. Hoping to serve you in 1955.
CALVERT APIARIES **Calvert, Ala.**

Are you ready for
National Honey Week?
October 25-30 is the date.

FOR SALE—2200 colonies and equipment, all or part. 1437 S. Euclid Ave., Ontario, Calif. Yukon 641-47.

FOR SALE—20 colonies in double brood chambers, 46 deep supers drawn comb excluders, extra bottoms and covers, 3 frame extractor, honey tank, electric uncapping knife and all related equipment. Best offer Jan. 1, 1954. Must sell. O. A. Colley, 838 Sheridan Street, Chicopeefalls, Mass.

SEEDS

HONEY PLANTS our specialty. Catalog on request. Pellett Gardens, Atlantic, Iowa.

MISCELLANEOUS

HAVE FOR SALE and WANT TO BUY used extractors of all kinds. John Layman, 702 West 6th St., Bloomington, Ind.

Bargains in new or used honey cans or Root Supplies for cash or honey. Buckeye Honey Company, 3930 N. High St., Columbus 14, Ohio.

MAGAZINES

Know interesting facts concerning the bees of India through the INDIAN BEE JOURNAL, published in English by the Bhupen Apiaries (Himalayas), Ramgarrh Dist. Naini Tal, U. P. India, or available through them. Subs. Rs9/ or 15 shillings or $2.25 yearly. Sample copy post free for Rs1/8/, or s2/6, or 40 cents (International Money Order). Payment in mint postage stamps of your country accepted.

ARCHIVE of BEE SCIENCE (Archive fur Bienenkunde), oldest scientific, independent bee journal in the world. Select feature material gives lasting theoretical and practical knowledge. Sample copies available. Two large 1953 editions for the low price of DM 5.50. Biene-Verlag (Bee Publishers), Lindau (B), Postcheck Karlsruhe 5581, Germany.

BEE WORLD, the international journal of the Bee Research Association, published monthly, contains the latest research reports on bees and beekeeping. With Apicultural Abstracts it costs $3.00 per annum. Apicultural Abstracts only $1.75 per annum from the Hon. Subscription Secretary, Bee Research Association, 10 Barnett Wood Lane, ASHTEAD, Surrey, England.

Read the South African Bee Journal. Published every two months. Subscription 7/6 per year to the Treasurer, P. O. Box 3306, Cape Town, South Africa.

INTERESTED in Angora Goats? Read the Sheep and Goat Raiser, Hotel Cactus, San Angelo, Texas, the only ranch magazine published serving the Angora Goat industry. Subscription $1.00. Sample copy, fifteen cents.

ITALIAN QUEENS
and
PACKAGE BEES
W. E. PLANT
Hattiesburg, Mississippi

U. S. Savings Bonds come in all sizes . . . . .and grow bigger every year.

RESEARCH DEVELOPS NEW OUTLETS FOR HONEY

(Continued from page 599)

Some new honey products developed as a result of research conducted at the Eastern Utilization Research Branch.

Basic investigations on the composition and behavior of honey are needed to develop information that can be used to improve our processing methods and to overcome technical problems in using honey for baking, candy making, and other industries.

Honey Research Should Benefit Agriculture as a Whole

As most everyone connected with apiculture knows, the value of bees as pollinating agents for crops is several-fold that of honey and beeswax produced. Yet in spite of this large value to agriculture, virtually the only monetary incentive the beekeeper has for keeping bees is the financial return from the sale of his honey and beeswax.

This is all the more reason for intensifying our efforts to develop profitable outlets for every pound of the honey that is produced. In this way beekeeping will be kept in a healthy condition, which in turn will preserve the value of our bees to agriculture through pollination of crops.

Queens **Queens**

ITALIAN

Nice large queens 55c each

Mitchell's Apiaries

Bunkie, La.

We Thank You

for the nice queen business given us this summer. We regret that we are having to close down our queen yards for the remainder of the season. This is due to the extreme drouth and its effect on bees in this immediate locality.

We will be ready again in the spring with both our Regular and Island Hybrid bees and queens.

"They Produce"

Rossman Apiaries

P. O. Box 133

Moultrie, Ga.

CAUCASIAN

QUEENS	QUEENS
1 - 24	$1.00
25 - 49	.90
50 - up	.80

Howard Weaver

Navasota, Texas

Booking orders now. Over 30 years a shipper. Send for Free Circulars.

BLUE BONNET APIARIES

Weslaco, Texas

U. S. Savings Bonds come in all sizes . . . . . and grow bigger every year.

B & Z Library

IMPORTANT

An opportunity for all beekeepers to save. All orders for both the **Two Queen Convertible Hive** and the **Rosedale Uncapping Planes,** accompanied with our advertisement of the **Two Queen Convertible Hive** in the August issue of either the American Bee Journal or the Gleanings in Bee Culture shall be entitled to a 20% discount, as long as this offer lasts. So if you want to save, now is your chance.

John J. Maendel
Forest River Colony
Fordville, N. D.

Manufacturers of the Two Queen Convertible Hive and the Rosedale Uncapping Planes.

High Quality Italian Queens
By Airmail
75c each. 10 or more, 65c each.
CARLUS T. HARPER
New Brockton, Ala.

LIVE AND LEARN

(Continued from page 622)

honey is scarce and don't want to get left.

Seriously, from my experience in the past, including last year when I got my first nine sections, I think that regardless of what system you have to use in your neighborhood, the prime requirement for the production of comb honey is this. It can be done over two brood bodies, but the colonies must be tremendously strong. Also, maybe it s o u n d s silly, but honey must be coming in. Also, the colonies must be kept from swarming. It could be that this is the first requirement, and the fact that the bees didn't want to swarm this year is hooked up some way with the fact that they did such nice work for me.

KNOW YOUR LABELS

(Continued from page 605)

and C;" that "this honey is produced under the most sanitary conditions," and that "it is not overheated in order to maintain its 'natural' flavor".

Likewise, suggestions for the novel use of honey could be included in the same way, and perhaps different uses could be printed on different lots of the same label so that a customer may obtain many different ideas from several purchases of the same brand.

Size of the Label

The package and its label can make or break a product regardless of the quality of the product in the container. The whole package must have a neat, artistic appearance which means good design, balance, and symmetry. In short, the package must have a professional appearance.

HOW A COUNTY ASSOCIATION PROMOTED NATIONAL HONEY WEEK

(Continued from page 631)

a ribbon leading from it to the recipe on the window was in the foreground, and the walls were decorated with honey posters and streamers.

The merchant was more than pleased with the interest and attention brought to the window; stating that practically every one coming into the store mentioned it to the clerks. No honey was sold in the store. It was strictly a honey display by the members of the Lorain County Beekeepers' Association, but it proved that honey attractively displayed will draw a great deal of attention and stimulate the interest of those who are not too familiar with honey and honey products.

At the conclusion of **National Honey Week** the merchant expressed his appreciation for the excellent display and stated he could have sold at least 2000 pounds of honey as a result of it.

What this group of beekeepers has found successful may be of interest to other associations another year.

U. S. Savings Bonds come in all sizes . . . . .and grow bigger every year.

HISTORY OF THE SMOKER

(Continued from page 593)

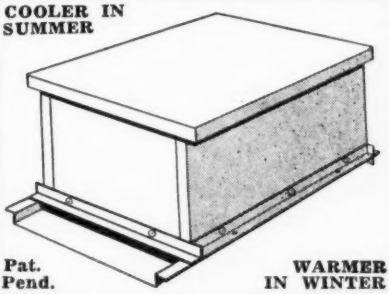
at the same time as much as possible through the nose."

Quinby who was later to invent a practical smoker recommended in 1853 the following: "Get a tube of tin about five-eighths of an inch in diameter, five or six inches in length, make stoppers of wood to fit both ends, two and a half or three inches long; with your nail-gimlet to make a hole through them lengthwise; when put together it should be about ten inches. The ends may be tapered. On one end leave a notch, that it may be held with the teeth, which is the most convenient way, as you will often want to use both hands; it is also ready, without any trouble to blow through, and also to keep the tobacco burning. When ready to operate, fill the tube with tobacco, ignite it, and put in the stoppers; by blowing through it you keep the tobacco burning while the smoke issues at the other end." Quinby did not change the above in his 1858 or 1866 editions.

Gallup (1869) preferred to use a pan of burning wooden chips or sawdust over which he blew. He first attempted to work the colony as long as possible without smoke, for he said, "bees that are managed with tobacco smoke are irritable—tobacco is good to cure scab and kill ticks on sheep, and that is about all."

The BRITISH BEE JOURNAL in 1874 stated in an editorial that a piece of India rubber tubing over the bowl of a pipe allowed the smoke to be directed where needed. Also in the same journal in 1909 is described a smoker which was about a hundred years old at the time. It is a fire box and has a revolving fan on one end which is driven by hand and forces smoke through the fire box and out a nozzle. It is described as being clumsy and it requires both hands to keep it going. In the same article is described a smoker with a spring and key which will run for half an hour. It was invented by M. G. deLayens in 1874, presumably in England.

(to be concluded)



UNI-TEMP ALUMINUM HIVE

Dealer Inquiries Invited.

The A. H. HALE CO.

Hapeville, Georgia, U.S.A.

QUEENS

Italian or Caucasian

Health certificate and live arrival guaranteed with each shipment. Send your requirement now.

— Price —

1-24	75c
25-50	65c
100 up	60c

FARRIS HOMAN

Shannon, Miss.

MOTH KILLER. Latest method kills all types insects scientifically, automatically, harmless to humans. Genie Insect Bulb, complete with pellets and guaranteed. $2.98 postpaid. Literature Free. KEITH VUNCANNON, R. 1. Asheboro, N. C.

NO MORE WAX FIRES

(Continued from page 629)

only about two square feet of floor space. The melting tank would occupy about the same space as the large steam-boiler some use. The canner-boiler is much safer. It may run dry with no damage except replacement of the gasket at a cost of a few cents at the hardware store. It can not blow up, as the safety or the slip-on hose will blow first. This boiler is adequate for a good sized job, melting the wax in the cappings, heating the uncapping knife or machine, and remelting previous wax-cake with the waste steam.

1954 is the Year to Promote Honey

QUEENS
ITALIANS

Due to the exceptionally hot dry weather we will not be able to supply any Caucasian queens this Fall. Can supply Italians promptly.

— PRICES —

In lots of	
1 - 24	$ .75
25 - 99	.70
100-499	.65

Queens Postpaid—Airmailed or Clipped—No extra cost.

The Stover Apiaries

Mayhew, Miss.

BRIGHT THREE-BANDED ITALIAN QUEENS

Our Strain is from early imported Italians. Their behavior is more according to pattern than most other races. They are usually gentle, hardy, good workers, and not inclined to swarm. Use our queens and you will be in line for all the honey crops and have nice bees to work with.

PRICES, balance of season:

1 to 50	80c each
50 or more	75c each

TAYLOR APIARIES
Box 249 Luverne, Ala.

LET'S TALK ABOUT HONEY PLANTS

(Continued from page 606)

ot E. N. Newsom, of McArthur, Ohio, a retired school teacher in his second year as a beekeeper. His 21 hives faced a field of two to three acres of red clover still in bloom. I noticed immediately that the clover heads were being worked by honey bees in addition to the usual bumblebees. After watching the bees for a while, I decided that most if not all the honey bees were collecting pollen rather than nectar. Mrs. Lovell took the cyanide jar and collected a dozen honey bees and a half dozen bumblebees while Mr. Newsom showed me his bee yard. My honey meter showed a percentage of 36 per cent of sugar in the nectar squeezed from the stomachs of the bumblebees, 5 per cent higher than I had found in New Hampshire. All but one of the honey bees had empty honey stomachs, but their hind legs had large loads of the typical drab-colored pollen of red clover. One honey bee had managed to obtain a little nectar and gave a reading of 29 per cent.

This brings to mind that there are two very different sides to the red clover argument. First, "Will honey bees pollinate red clover?" The answer from this and hundreds of studies is clearly "Yes, if there are enough bees and a shortage of other flowers." The second question is, "Is red clover a good honey plant?" The answer is certainly "It is not." Although occasionally a beekeeper obtains a few pounds of honey which he is fairly certain came from red clover, there are so many cases where red clover fields are rarely visited by honey bees, that I cannot but conclude (regretfully, of course) that red clover is a minor honey plant at best. I told Mr. Newsom that he should plant one of the shorter-tubed species such as white Dutch, Ladino, or alsike clover.

Sage. L. B. Crawford of Santa Ana, California, writes that, "We get only one crop of sage honey in four or five years. This condition is due to the sage entirely depending on the rain fall. We have been plagued with a cycle of dry years the past ten years. But when we do get 15 to 20 inches of rain during the winter, we are sure set up for a real honey year. The honey is white in color and practically never granulates if the sage is pure. It is in great demand for bottled honey." Sage honey is certainly one of the five most famous honeys in the United States. It is too bad that it has such a restricted range and yields so irregularly.

Garon's 3-Banded Italians		Dadant's 4-Way Starline Hybrids
1-24	80c	$1.25
25-99	75c	1.20
100-up	70c	1.10

Queens clipped and/or marked and Air Mailed upon request.

Reg. U.S. Pat. Off.

GARON BEE COMPANY Donaldsonville, La.

York's Quality Bred Queens

Two Strains

Queens Bred Up to a Quality—Not Down to a Price

York's Italians		Dadant's Starlines	
1-24	$1.00	1-24	$1.40
25-99	.85	25-99	1.30
100-up	.75	100-up	1.20

Reg. U.S. Pat. Off.

The Preference of Leading Honey Producers

York Bee Company Jesup, Georgia

(The Universal Apiaries)

LAST CALL THIS FALL!

Due to unprecedented drought and conditions unfavorable for rearing highest quality queens, we have already discontinued grafting for the season.

Orders will be filled so long as queens on hand hold out.

Thank you one and all for the nice business you have sent our way. Looking forward to next season, when we will be ready to serve you as in the past, if in God's providence we might be favored with the necessary rain to make the flowers bloom again.

Reg. U. S. Pat. Off.

JENSEN'S APIARIES Macon, Mississippi U.S.A.

ITALIAN "GULF BREEZE" QUEENS

October brings to a close our queen shipping season. We have enjoyed a very good year and will be ready to serve you again next year.

Prices: 1-24, 80c 25 up, 75c each AIR MAILED

BESSONET BEE COMPANY Donaldsonville, La.

ITALIAN
Package Bees and Queens
Jackson Apiaries
Box 58 Funston, Ga.

Package Bees & Queens
Quality & Service
C. F. KOEHNEN & SONS
Glenn, California

U. S. Savings Bonds come in all sizes . . . . .
and grow bigger every year.

Good Queens. Three Banded Italians only. Tops in production and gentleness. The choice of leading beekeepers for more than 30 years.

85c each 10 ..... 80c each 25 up ..... 75c each

Airmail, postpaid. No disease.

Requeen now through October for maximum production and less swarming next year.

H. C. SHORT Fitzpatrick, Ala.

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